Saving Lives, Saving Energy: Rural telemedicine and green computing projects win awards through the 2008 Computerworld Honors Program for using IT to benefit society. PAGE 14

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Already outgrowing your data center? Here's what you need to know to rebuild. **PAGE 28**

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Inside

JUNE 9, 2008
VOL. 42, NO. 24 $5/COPY

News Analysis

Microsoft insists that its container-based data center plan will work. But others aren't so sure. PAGE 18

THE GRILL: Computer pioneer Gordon Bell names his all-time favorite computers and describes the state of telepresence. PAGE 23

Opinions

The global IT community is a positive force against narrow-minded thinking. PAGE 4

Thieves are getting better at profiting from stolen data, and it's time for IT to stop them. PAGE 48

Careers

IT pros need to learn that 'marketing' isn't a dirty word. PAGE 45

Don't Miss . . .

ON THE MARK: Capture your scribbles with digital ink. PAGE 22

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Inside

COMPUTERWORLD ■ JUNE 9, 2008

SPOTLIGHT | DATA CENTERS

■ NEW DIGEST

6 BNY Mellon sets **new policies** to protect **customer data** after two couriers **lose backup tapes.** | A **data breach** at medical insurer United Healthcare is linked to **155 cases of identity theft** affecting UC Irvine graduate students.

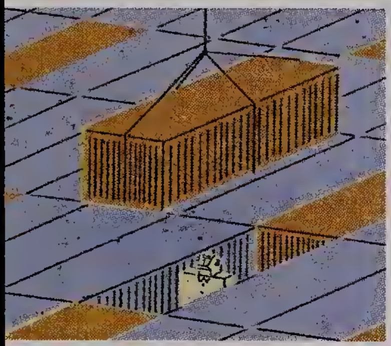
9 A **disk failure** in an aging Sun server causes an **FAA database** to crash. | Oklahoma City's **municipal Wi-Fi** network supports applications for **city workers** but not **public access**.

12 An **explosion and fire** shuts down a **data center** for 30 hours because fire officials wouldn't allow **backup generators** to be turned on.

■ NEWS ANALYSIS

14 Saving Lives, Saving Energy: IT Projects With Real Benefits. At the 20th annual Computerworld Honors Program awards ceremony, more than 200 organizations were recognized for their beneficial uses of technology.

18 Is Microsoft Boxing Itself Into an IT Corner? Microsoft and other advocates of container-based systems claim that they're easier to deploy and manage in data centers than regular servers are. But some critics are skeptical that the container approach will prove to be more than a short-lived phenomenon for a limited set of users.



■ OPINIONS AND FEATURES

4 Editor's Note: Don Tennant sees IT at its best as a force against shallowness of thought and divisiveness.

22 On the Mark: Mark Hall takes note of the latest in digital ink technology.

23 The Grill: Computer pioneer **Gordon Bell** talks about his favorite computer of all time, the state of telepresence and his good friend Jim Gray.

45 Career Watch: How to market IT within the enterprise; and what a recent survey on employee-retention strategies reveals.

47 Shark Tank: A Unix shop does a little Windows dressing.

48 Frankly Speaking: Frank Hayes urges a reality check for all those organizations (including the IRS) that are still using Social Security numbers as customer identifiers.

■ ALSO IN THIS ISSUE

Online Chatter 5

Company Index 47

SPECIAL REPORT

28 Your Next Data Center. Data centers are bursting at the seams, so despite a slowing economy, companies are redesigning and building new data centers to increase efficiency and accommodate growth. Here's how to rethink – and rebuild. **PLUS:** IT executives and industry experts tell us about their ultimate wish lists for a brand-new, built-from-scratch data center.

THE MASTER PLAN. How to manage five key aspects of your next data center.

34 How to Build It. When building your next data center, your best bet is to be flexible and keep an eye on your company's future needs. Here are some goals to bear in mind.

36 How to Move It. New technologies are helping data center movers speed the transition process and upgrade efficiencies.

38 How to Pay for It. Once a decision is made to build a new data center, the IT manager must negotiate with vendors to get the best deal. And the more you buy, the more leverage you have.

40 Where to Put It. Most IT managers have to make the best of wherever their data center is located. But if the choice is yours, here are some tips for finding the right spot.

42 How to Staff It. Data centers require fewer and fewer workers these days. But those with virtualization skills are in high demand. Here's what you need to know.

44 Opinion: Beyond the Physical. Not every IT demand can be fulfilled by shoehorning more resources inside the shrinking corporate data center. You need to know when and what to let go, says columnist Mark Hall.

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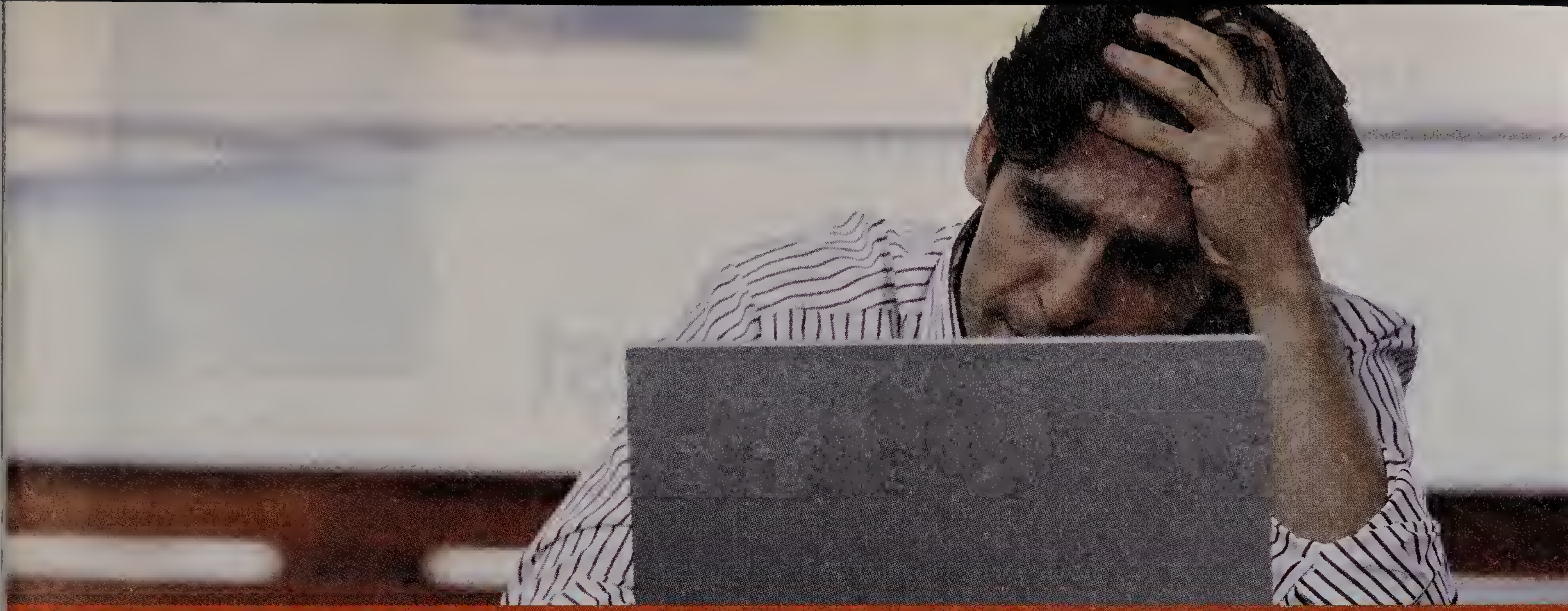

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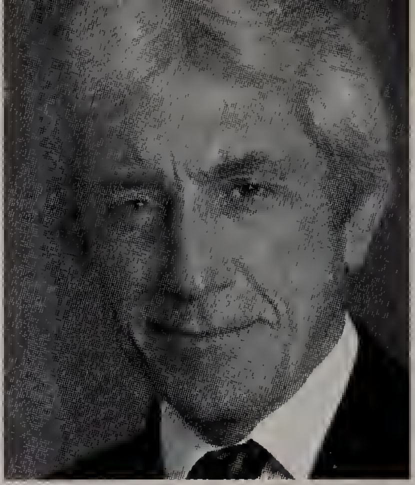
EDITOR'S NOTE

Don Tennant



Best and Brightest

LAST WEEK'S end to the presidential primary season would have been a lot more welcome if it wasn't the precursor to an even more determined orchestration of divisiveness in this country.

From now till November, the spewing of political venom will only intensify — not so much because the candidates themselves are so inclined, but because so many columnists, bloggers and talk show hosts have such a receptive audience for their rants.

I've experienced no shriller herald of what's to come than what I heard one afternoon on a radio talk show in Boston. It was May 13, and I was listening to Jay Severin, a polarizing conservative Republican talk show host who refers to his audience as the "best and brightest."

For months, Severin has shown particular disdain for Sen. John McCain, faulting him for his positions on key conservative issues. On this particular afternoon, he pounced on a statement that McCain had made the previous day on global warming: "The United States will lead . . . with a different approach — an approach that speaks to the interests and obligations of every nation." While that would seem to be a logical approach to a problem that transcends national borders, Severin inferred that McCain was prepared to compromise the office of the presidency, because, he insisted, the responsibility of the president is to further the interests of the U.S., and only the U.S.

It was the type of argument that relies on an audience's antipathy toward a given scenario — in this case, the president focusing on the welfare of people outside of the U.S. as much he does on the citizens he was elected to lead, protect and serve. Equally, it relies on that audience's disinterest in considering the larger issue at hand.

Oddly enough, it was a commercial later in the program that crystallized my perception of Severin's dependence on his listeners' shallowness of thought. Severin did a promotion for a local rug company, in which he offered the type of personal product endorsement that is a common practice of radio personalities. He stressed that he had the company's rugs in his own home, and he encouraged his listeners to follow suit.

It was the type of argument that relies on an audience's disinterest in considering the larger issue.

What was especially interesting was that Severin listed some of the Middle Eastern countries that supply the rugs, including "Persia." Persia? Why would Severin use the old name of the country that changed its name to Iran 73 years ago? Sure, I understand that Persian rugs are appealing, but referring to the country as Persia is like including Prussia in a list of European countries. Did Severin use the old name in order to mask his endorsement of products from Iran?

I wrote to Severin's two publicly available e-mail addresses on May 13 to ask him, but he hasn't responded. I also posed the question as a comment on his blog, but it never went live (comments are screened).

Of course, I already know the answer. Severin was comfortable that the "best and brightest" wouldn't make the connection between Persia and Iran. He knew his listeners' shallowness of thought would cover him, just as it would in the case of the McCain bashing.

My intent is not to bash Severin, but simply to illustrate the lack of depth that's pervasive in so much of what we experience, and how that shallowness is ripe for manipulation.

The reason I'm bringing all this up in the first place is to share my conviction that one of the most valuable and influential resources available to the world at large to counter this shallowness of thought is the community of leaders in the IT field. This is a long-held conviction, and one that was powerfully reinforced last week in Washington.

It was there that representatives of 204 companies and organizations from 26 nations gathered to be recognized by the Computerworld Honors Program for outstanding achievement in using IT to serve humankind. The individuals and organizations that were honored embody a global quest for information that will ultimately starve those who feed off of shallowness of thought and the divisiveness it fosters. That's what one would expect of the true best and brightest. ■

Don Tennant *is editorial director of* Computerworld *and* InfoWorld. *Contact him at don_tennant@computerworld.com, and visit his blog at* http://blogs.computerworld.com/tennant.

■ ONLINE CHATTER

RESPONSES TO:

IT Research: Is It Time to Analyze The Analysts?

May 28, 2008

There are fundamental flaws in the whole IT analyst business that never get addressed.

1. If your IT team needs to buy information on what is going on in the industry, perhaps you're in the wrong field. If you want to be successful in IT, you must keep up. If you need to wait for an analyst to tell you what's happening, you're already behind. Yes, it takes a lot of time to do, but it is part of the job.

2. Analysts that have vendors as customers can be biased and potentially have a conflict of interest.

I am not a customer of analyst firms. When I was, I found their advice dated or flat-out misguided.

■ **Submitted by:** *Robert*

As a former Gartner and Meta Group employee, now running my own firm, I can confirm that vetting your analysts and their firms is simply a good consumer practice. Most of us who have started our own firms after toiling in the larger IT research analyst firms will tell you we did it in order to have more control over quality of research and research analysts. That quality can be extremely uneven, and smart consumers can tell the difference.

Those of us who back our opinions with solid, deep research encourage our clients to make up their own minds based on their own analysis of the same data. What we do is simply provide a shortcut, and the more they come to trust us, the less time they spend vetting our analysis.

The best way to evaluate an analyst in any decision-making situation? Ask, "What would you do if you were me, and why?" If the answer is not in the context of your specific constraints, the analyst is either lazy or not competent. If the answer doesn't include some kind of hard data or empirical research to back up the advice, you may be on thin ice.

■ **Submitted by:** *David Foote*

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Extreme IT: Battling Dust, Heat and Bombs In Afghanistan And Iraq

Think your job's tough? IT pros in the U.S. military combat extreme temperatures, "moon dust" and mortar attacks to keep communications – including multiple networks – up and running.

15 Great Gadgets You Can't Get in the U.S.

You have to go outside the U.S. – or to the online gray market – to get these goods, including a laptop that kills physical viruses and bacteria on contact.

NASA: Robotic Arm Key To Finding Life on Mars

Engineers are beaming up daily software code to run the 7.5-ft. arm and analyze soil samples.

Review: New 17-in. MacBook Pro Wins Over a Skeptic

Our reviewer spent a week getting to know Apple's newest 17-in. MacBook Pro – the 2.6-GHz model with LED backlighting, to be specific. Although he's still not sure it's the perfect machine for him, he got to really like it.

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News Digest

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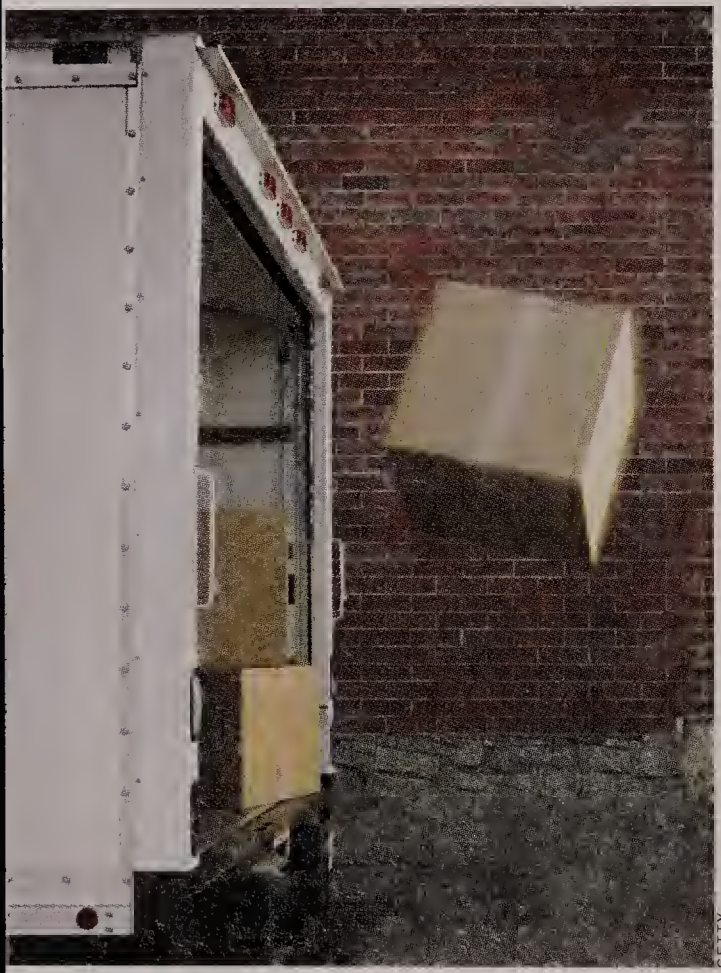
THE WEEK AHEAD

MONDAY: Apple begins its Worldwide Developers Conference in San Francisco with a keynote by CEO Steve Jobs; a new iPhone model is expected. Also, *Computerworld*'s Mobile & Wireless World conference opens in Miami.

TUESDAY: Microsoft plans to issue its monthly batch of security fixes – seven total, three of them rated critical.

TUESDAY: The second of Microsoft's two Tech-Ed 2008 conferences, this one aimed at IT pros, starts in Orlando.



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DATA BREACHES

Lost Tapes Prompt IT Changes at BNY Mellon

AFTER ITS third-party couriers twice lost unencrypted backup tapes, The Bank of New York Mellon Corp. late last month launched plans to encrypt stored data and to limit the confidential client data it saves on tape drives.

The company announced the new policy just days after disclosing that a courier it wouldn't identify lost a storage tape in April and that Miami-based Archive America Ltd. lost a box of tapes heading for an off-site storage facility in February.

The breaches exposed sensitive information on more than 4.5 million people and 747 companies, said the New York-based bank.

BNY Mellon officials declined to discuss how the tapes were lost but did confirm that the bank no longer uses Archive America, which wouldn't comment on the incident.

BNY Mellon said that it will provide two years of free credit monitoring, credit-freeze benefits and a $25,000 identity theft insurance policy to those affected. "We deeply regret that this occurred and sincerely apologize to all of those impacted," said Todd Gibbons, chief risk officer at BNY Mellon, in a statement. Gibbons said there is no indication that data on the missing tapes has been misused.

The updated policies require that any confidential data written on tapes or CDs for transport be encrypted or carry additional protections. Gibbons said the bank will demand that such data be delivered to off-site facilities electronically when "technically feasible."

Connecticut Attorney General Richard Blumenthal, who said that the missing tapes contain data on nearly 500,000 state residents, last week noted that the bank has yet to tell him how the breach occurred, who is responsible and why customers weren't notified promptly. "There are still some important questions that have to be answered," he said.

The backup tape lost in April was in transit from BNY Mellon's Working Capital Solutions operation in Philadelphia to a branch office in Pittsburgh. It included images of scanned checks and other documents relating to payments made by BNY Mellon clients.

In the February incident, the lost backup tapes were being transported from Mellon Shareowner Services in Jersey City, N.J. They included the names, birth dates and Social Security numbers of customers of BNY Mellon and People's United Bank in Bridgeport, Conn.

— Brian Fonseca

SECURITY

Data Scam Hits Grad Students

A DATA BREACH at United Healthcare Services Inc. early this year led to a rash of identity thefts at the University of California, Irvine.

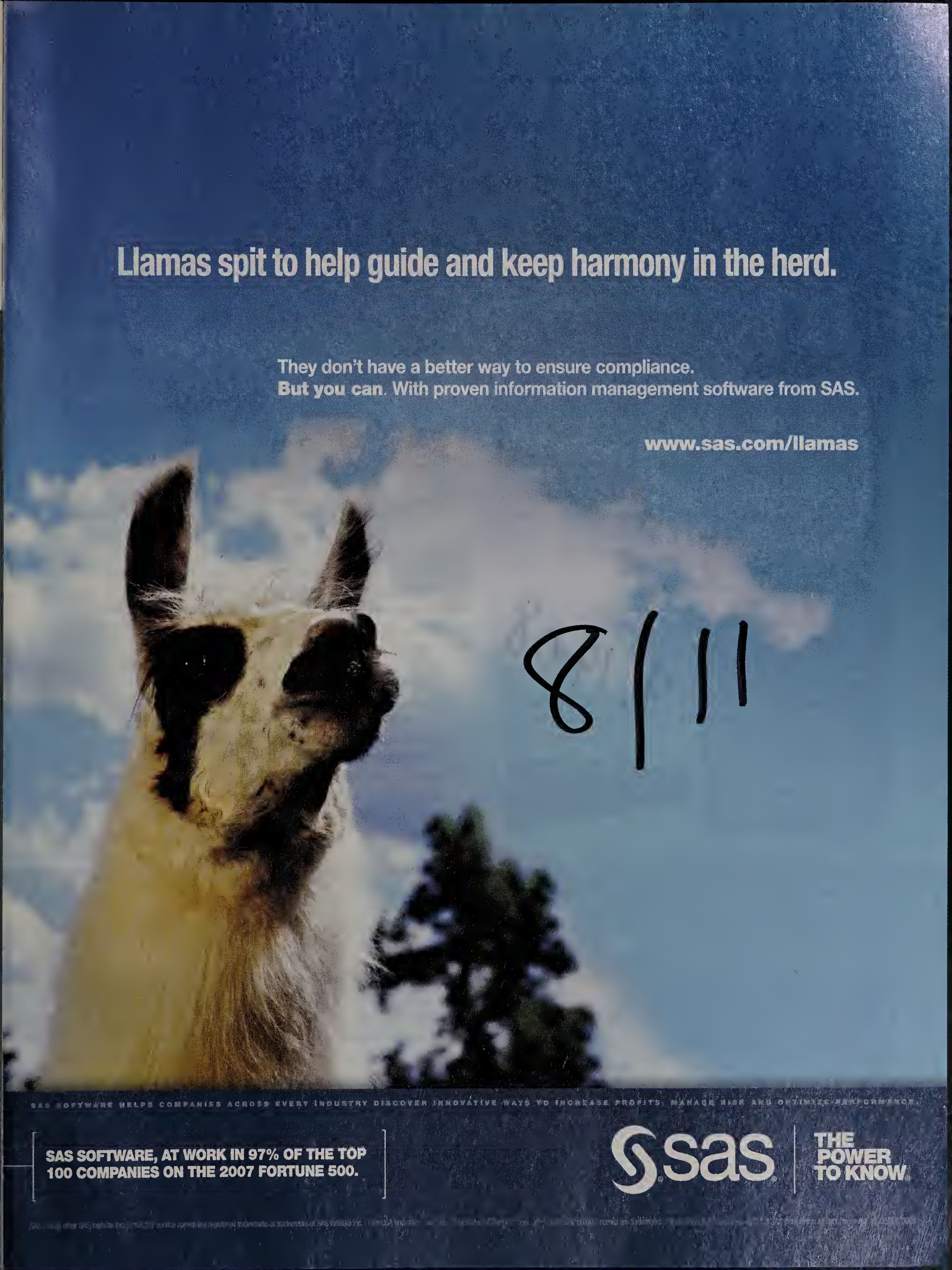
The school said that since February, 155 of its graduate students have been hit by the scam, in which criminals filed false tax returns in the victims' names and then collected their tax refunds.

> **■ Students reported to police that when they tried to file their income taxes, returns had already been filed using their Social Security numbers.**

The breach exposed the personal data of 1,132 students enrolled in the university's health insurance program during the 2006-07 school year, said UCI spokeswoman Cathy Lawhon. Minnetonka, Minn.-based United Healthcare is the provider of the program.

A United Healthcare spokeswoman noted that other customers weren't affected. "As far as we know, this situation was isolated to UCI," she said.

– ROBERT McMILLAN,
IDG NEWS SERVICE



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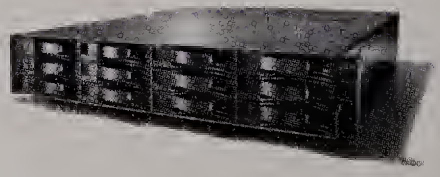

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ISTOCK

HARDWARE

FAA Blames Disk Failure For Database Crash

A DISK FAILURE in an aging server from Sun Microsystems Inc. caused a key Federal Aviation Administration database to crash and be unavailable for nearly 20 hours late last month, according to the FAA.

The Notam, or notice to airmen, system went down late on the night of May 22. The database provides notices to commercial and private pilots about airport, equipment and security issues. Engineers had the database back online the next day at 7 p.m., FAA officials said.

After the failure, the FAA moved quickly to supply the flight data to pilots through local air traffic controllers and various alternate systems. The latter included a Web site set up on the fly to provide up-to-date information to pilots online, said Barry Davis, manager of aeronautical information management at the FAA in Washington.

There were no flight-safety problems during the outage, the FAA said.

"What happened was the drive in an end-of-life Sun box failed in the middle of updating the information on the hard drive, so it screwed up the database," Davis said.

The FAA engineering team replaced the server shortly after the failure and initially believed that the Notam system had returned to normal, he said.

"We already had the equipment to replace [the box]; we just hadn't done it yet. That's why the hardware recovery was quite simple — we just put the boxes in," Davis said.

However, the database problems weren't resolved so quickly, he noted. The performance lagged at first, forcing the engineering team to begin further work to fix the database.

Finally, Davis said, "we resynchronized all of the subsystems so everyone had the same database copy, and then we opened the gates up at 4:40 p.m. on Friday [May 23] so that all of the information would come into the system."

Davis and his team spent the rest of that night monitoring the situation to make sure that no other errors occurred.

Although everything was updated by 7 p.m. that evening, Davis noted that top FAA officials decided to keep the temporary Web site working until midnight as a precaution.

— *Linda Rosencrance*

Short Takes

- **The Federal Trade Commission** and **Intel Corp.** both said on Friday that the FTC has begun a formal antitrust investigation of the chip maker. Intel said it will continue to cooperate with the FTC, which had been conducting an informal inquiry since 2006. But the company added that it thinks its business practices "are well within U.S. law."

- Meanwhile, **Advanced Micro Devices Inc.** moved to broaden its rivalry with Intel by announcing the Turion X2 Ultra, its first processor designed specifically for laptops.

- **Sun Microsystems Inc.** confirmed that it plans to start selling solid-state disk drives made by third-party manufacturers. Sun said it will ship a 2.5-in. SSD device this year and a 3.5-in. model in 2009.

- **AT&T Inc.**'s online store began displaying an "out of stock" message next to both the 8GB and 16GB models of **Apple Inc.**'s iPhone – another sign that Apple may soon be releasing a new model of its popular handheld device.

MOBILE & WIRELESS

Oklahoma City Supports Wi-Fi – for Its Own Use

OKLAHOMA CITY'S government last week cut the ribbon on a municipal Wi-Fi network that supports 150 applications used by police, firefighters and other city workers – but no public wireless services.

The city had planned to provide free or low-cost Wi-Fi access to residents and businesses via a deal with EarthLink Inc. But Mark Meier, Oklahoma City's IT director, said that EarthLink backed out last year before anything was formalized. Despite the talks with EarthLink, it has since withdrawn from the Wi-Fi market entirely.

Meier said he thought that having ISPs build Wi-Fi networks and then support them by advertising "was a failed business model from the get-go." Opening up the new network to public use is still possible, he said. But access might be limited to municipal Web sites and other local services.

The city-owned Wi-Fi network cost $5 million to build and provides coverage over a 555-square-mile area. It is based on a mesh of 1,200 fixed and 850 mobile Wi-Fi nodes. Meier said the mobile nodes greatly reduced the number of fixed ones that needed to be installed on telephone poles and buildings, saving the city money on the project.

The network is being managed as part of the city's overall IT infrastructure, not separately. "When we first started the process, [that] was deemed a very big risk," Meier said.

– MATT HAMBLEN

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IN THE WORLD OF ENTERPRISE INTEGRATION

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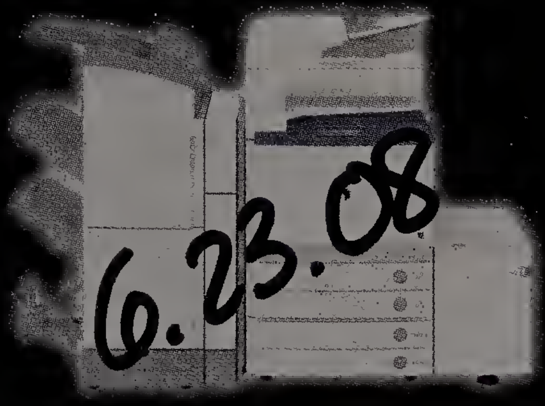

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DISASTER RECOVERY

Blast Knocks Data Center At Hosting Firm Offline

AN EXPLOSION and fire that occurred May 31 at a data center in Houston operated by The Planet.com Internet Services Inc. shut down the server hosting facility for about 30 hours. And as of Friday, 300 of the 9,000 systems there were still out of service or having technical problems.

ISTOCK

The outage, which was caused by a short-circuit in a transformer within the data center, affected about 7,500 Planet.com customers, many of them small businesses. And it exposed an Achilles' heel in data center continuity planning.

Planet.com says on its Web site that its data centers are designed to run without interruption. But fire officials wouldn't let the company turn on its backup generators at first because of concerns that doing so might spark another fire.

The hosting vendor was finally allowed to activate the generators early last Monday, and about 6,000 servers were restored that morning. Planet.com said then that it hoped to have the other 3,000 systems back online that night.

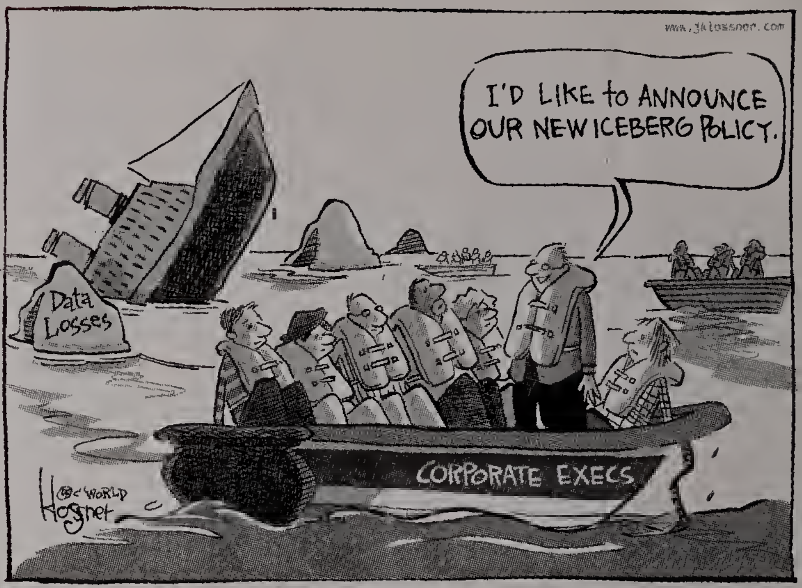
But a faulty breaker in one of the generators again shut down power to those servers early Tuesday, according to messages posted by Planet.com staffers on the company's customer support forum. And after a new generator was installed, workers discovered that many of the 3,000 servers — which were located on the first floor, where the explosion took place — required operating system reloads as well as new power supplies and other components.

A sprinkler system quickly doused the data center fire. But the explosion was strong enough to push three walls several feet from their original positions, and some underground cabling was destroyed. As a result, Planet.com expects to continue running part of the data center on generator power until next weekend.

— Patrick Thibodeau

BETWEEN THE LINES

By John Klossner



BENCHMARKS LAST WEEK

Yahoo Inc. set Aug. 1 as the new date for its annual meeting, which promises to be contentious after Yahoo's fending off of a buyout bid by **Microsoft Corp.** Multiple proposals to replace Yahoo's board are expected.

Verizon Wireless said it plans to buy **Alltel Corp.** for $28.1 billion, which would make it the largest wireless carrier in the U.S., bumping **AT&T Inc.** from first place.

30 YEARS AGO: Intel Corp. introduced the 8086, its first 16-bit microprocessor – launching what eventually came to be known as the x86 architecture.

Global Dispatches

Intel Fined in Antitrust Case

SEOUL – The Korea Fair Trade Commission last week fined Intel Corp. 26 billion won ($25.4 million U.S.) after concluding that the chip maker abused its dominant position in the microprocessor market.

The trade commission said that Intel's practice of offering rebates to South Korean computer makers if they agreed not to buy chips from rival Advanced Micro Devices Inc. violated the country's fair trade rules.

Bruce Sewell, Intel's general counsel, said the company disagrees with the ruling and contended that the commission didn't give full consideration to the evidence Intel presented.

The findings are expected to be published in 30 to 60 days. At that point, Intel will have 30 days to review them and appeal the ruling to the high court in Seoul.

Sumner Lemon,
IDG News Service

India, Brazil File OOXML Appeals

GENEVA – India and Brazil late last month appealed the adoption of Microsoft Corp.'s Office Open XML document format as an ISO standard.

Their appeals join one filed days earlier by South Africa. All were submitted to the ISO standards body and the International Electrotechnical Commission, both based here. The two groups jointly approved the Open XML standard this spring.

"By the deadline, we had received three appeals, from Brazil, India and South Africa," said Jonathan Buck, a spokesman for the IEC.

Peter Sayer,
IDG News Service

BRIEFLY NOTED

The European Commission is testing cross-border electronic identity systems in an effort to create pan-European recognition of the 30 million national ID cards now used in 13 member countries. The three-year, €10 million ($15.4 million U.S.) project is being overseen by the U.K. Identity & Passport Service and Government Gateway Web portal.

Computerworld U.K. staff

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Verghese Jacob of the Byrraju Foundation said that a new emergency-response system has helped save lives in India.

IMAGELINKPHOTO.COM

Saving Lives, Saving Energy: IT Projects With Real Benefits

More than 200 organizations were recognized last week for using technology to make a difference. **By Patrick Thibodeau**

WASHINGTON

IN ADDITION to enriching IT services firms, the growth of offshore outsourcing in India is fueling efforts to use technology to improve — and even save — lives in that country.

For instance, three Indian states with a combined population of about 130 million people now have access to automated emergency call center services that were developed by the Emergency Management and Research Institute, a not-for-profit organization in the city of Secunderabad.

EMRI mobilizes help as soon as someone dials 108 on a phone. That number puts callers in touch with a round-the-clock dispatch center that can automatically notify police, fire and medical authorities of emergencies; log calls for audio replay; and send out EMRI-operated ambulances equipped with technologies such as GPS locators and videoconferencing links.

"So far, we have saved 20,000 lives over the last two years," said Verghese Jacob, chief integrator and lead partner at the Hyderabad, India-based Byrraju Foundation, which has been funding EMRI. That count, Jacob added, is based on the number of cases in which help was provided quickly enough to make a difference in the survival of patients.

EMRI, which hopes to deploy the emergency-response system nationwide by 2010, was one of 10 organizations that received top recognition for their uses of technology at the 2008 Computerworld Honors Program awards ceremony here last week.

The Byrraju Foundation, which, like EMRI, was set up by the founders of offshoring vendor Satyam Computer Services Ltd., also won a 21st Century Achievement Award for a telemedicine program that delivers health care services to rural residents of Andhra Pradesh state via videoconferencing.

The award winners were chosen from among 50 finalists, which came from a wider group of 204 organizations named Honors Program Laureates for submitting case studies about IT projects that met criteria for originality, breadth of vision and significance to society.

A common thread among many of the winners at the 20th annual awards ceremony was their use of videoconferencing technology to support remote users.

For instance, Deaf Link Inc. offers a video-based American Sign Language interpretation service that companies and other organizations can use to deliver information to employees and customers who are deaf or hard of hearing.

Kay Chiodo, Deaf Link's president and CEO, said the service is being used in Texas to send out alerts about hurricanes and other emergencies. Calls are placed to subscribers' cell phones, which vibrate to indicate the receipt of an e-mail containing a video message delivered in sign language.

In addition, the Cleveland Metroparks Zoo received an award for using a Cisco wireless mesh network and videoconferencing tools to offer a real-time distance-learning program that lets school students view the zoo's seven most popular exhibits. "We're reaching out to those students that don't have an opportunity to visit a zoo in their area," said Cathy Ryan, an education specialist at the zoo.

Projects that are providing financial benefits were also recognized. Among them was a server consolidation project at the Virginia Credit Union in Richmond. The credit union, which won a Laureate medal, estimates that it has reduced its annual data center power bill by $100,000 after consolidating rack-mounted systems into server blades in a virtualized environment.

Chris Saneda, the credit union's CIO, said the project eliminated 200 servers, about one-third of the total that was in place before the changes were made. ■

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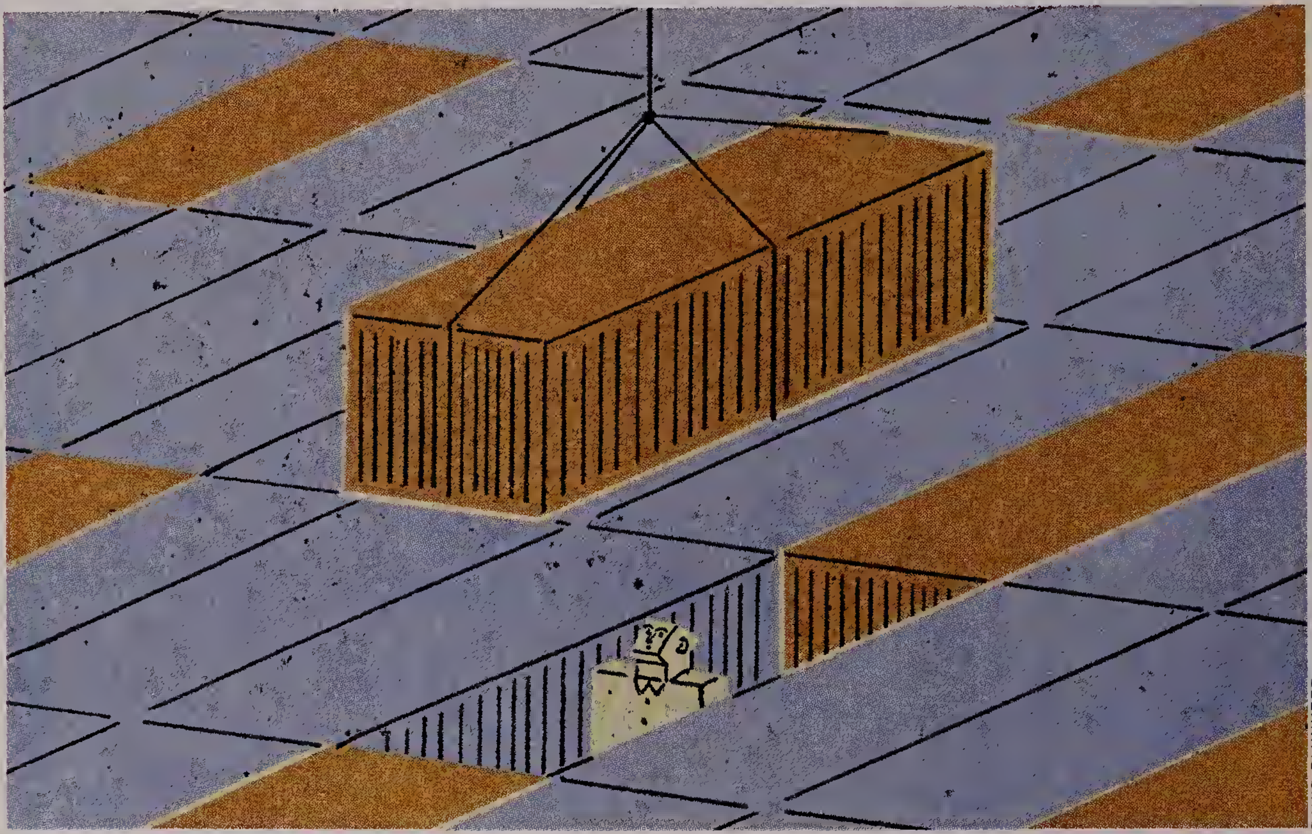
Is Microsoft Boxing Itself Into An IT Corner?

The software vendor insists that its container-based data center approach will work. But some outsiders aren't so sure. **By Eric Lai**



DAVID PLUNKERT

IN APRIL, Microsoft Corp. announced an ambitious plan to fill the first floor of a new data center it's building near Chicago with up to 220 40-foot shipping containers. Each will hold as many as 2,000 servers already mounted on racks, wired to networking equipment and ready to power up.

Microsoft and other advocates claim that container-based systems are easier to deploy and manage than conventional server setups are, especially at the immense scale that the software vendor has in mind at the facility in Northlake, Ill.

Michael Manos, Microsoft's senior director of data center services, wrote in a blog post after an earlier version of this story was posted on *Computerworld.com* that the container plan was meant to challenge "conventional and dogmatic thinking" about IT facilities. Data center technology, he added, "has by and large stood still for the last two decades."

With Microsoft driving the container bandwagon, more hardware vendors are jumping on board. IBM said in late April that it plans to offer servers in a container configuration, adding its name to a list of suppliers that includes Sun Microsystems Inc. and a couple of smaller vendors. Dell Inc. and Hewlett-Packard Co. may join in as well.

But some critics are skeptical about whether container-based systems are as wonderful as Microsoft claims. For instance, Jeff Biggs, senior vice president of operations and engineering at data center operator Peak 10 Inc., said he thinks the new approach will be a "very short-lived" phenomenon with limited appeal.

Here are some of the bones that the critics pick.

1 Is this Lego-style modularity or Russian-doll-like nesting overkill? What Microsoft sees as plug-and-play modularity, Peter Baker, vice president of information systems and IT at Emcor Facilities Services Inc., describes as "building infrastructure on top of infrastructure."

One example is in the area of power management, said Baker, who for many years worked as an electrical engineer building power systems for data centers. He said the uninterruptible power supplies needed by all of the containers could create harmonics — potentially destructive pulses of electricity resulting from conversions between AC and DC. Addressing the harmonics issue may negate the potential ROI of using containers, Baker added.

Manos acknowledged that Microsoft closely reviewed the question of harmonics. But he said in an interview that the challenges "have long been solved." And in his later blog post, he contended that using containers can be as much as 20% less expensive than operating a traditional data center is.

2 Containers aren't as plug-and-play as they seem. Setting up servers on racks inside containers and trucking them cross-country is a recipe for broken equipment, said Mark Svenkeson, president of Hypertect Inc., a Roseville, Minn.-based company that builds data centers.

And, he said, having single power, cooling and networking connections to all of the servers in a container means that an accident — such as severing a cable — could cause thousands of servers to go dark at one time.

Manos retorted that in "tens of deployments" of containers dating back to last year, "the most servers we've had come back DOA is two." And in his blog post, he said the concerns about power cutoffs are simply off base. "You would need a mighty big shoe size to trip over and unplug one of these containers," he wrote.

3 Containers can leave you less agile. Microsoft's research shows that 20% to 50% of system outages are caused by human error. To minimize such incidents, Microsoft plans to forbid systems administrators from entering a container to attempt fixes, even for something as simple as rebooting a server. It's also keeping the IT staff in Northlake to a minimum: just 35 people spread across all shifts at the 24/7 facility.

The servers will be managed remotely, Manos said. And as individual systems within a container fail, they won't be replaced; they will just be left to sit unused.

That could become a cost issue as the number of dead servers in a container increases, said Dave Ohara, an independent data center consultant and blogger.

"Say 25% of the servers have failed inside a container after a year," Ohara said. "You may say you don't need that compute capacity — fine. But what's potentially expensive is that 25% of the power committed to that container is doing nothing."

Manos acknowledged that Microsoft could "strand power" if, for instance, a server lost its hard drive but continued to draw electricity. He also said that power will be somewhat "hard-wired" within the data center, meaning that it may not be possible to redistribute excess power sent to a container doing less processing work than it initially did.

But Microsoft can kill balky machines remotely or "prune" their power, Manos added. And if the server failure rate gets too high, or wasted power does become an economic drain, the company can replace the entire container "significantly more easily" than it could swap out individual servers, he said in his blog post.

4 Containers are just a temporary solution. Microsoft is in the midst of a huge data center expansion to accommodate its growing Windows Live and Office Live online services. But what happens when that expansion inevitably slows? Eventually, adding systems one 2,000-server container at a time may start to feel like buying a 50-pound bag of dog food for a toy poodle.

Peak 10's Biggs said he thinks that containers will prove to be an "ephemeral" model even for online-service providers like Microsoft. And he doubts that any operators of mainstream data centers will adopt them, because their scale is simply too large. "They're kind of a novelty," Biggs said.

Manos agreed that containers aren't a be-all and end-all solution. He pointed out that the second floor of the 550,000-square-foot Northlake data center will be fully made up of conventional server racks.

But containers will "continue to be an important piece of the puzzle" for Microsoft, Manos said, adding that they provide an opportunity "to increase the scale unit from server to rack to mini data center."

5 Containers may run up against mechanical engineering limits. Containers seem to offer a magic bullet for addressing nagging power and cooling issues, but can they fulfill that promise? "I think IT guys look at how much faster we can move data and think this can also happen in the real world of electromechanics," said Emcor's Baker.

But Manos noted that his team consists almost entirely of mechanical engineers and facilities experts, not software developers. "We understand the problems, we understand the physics," he wrote in his blog post.

Overall, Manos remains unfazed by all the doubts. He thinks the skeptics will be convinced when Microsoft reveals more of what it has learned about container-based systems while testing them for the past year.

"Half the people say this is the greatest thing they'd ever heard of," he said. "The other half say this will never work inside a data center. But the fact of the matter is that this does work."

We'll see. ■

Green May Not Be Microsoft Data Center's Best Color

LIKE MANY OTHER COMPANIES, Microsoft is trying to portray its new data centers as exemplars of green computing. For instance, the software vendor says it's taking pains to make its Northlake facility as energy-efficient as possible, through steps such as pulling in outside air to help cool systems – a process known as airside economization (see "How to Pay for It," page 38).

But skeptics contend that Microsoft is trying to put lipstick on a pig, pointing out that the data center is expected to devour up to 198 megawatts of electricity – enough to power about 200,000 homes – from three substations being built on-site.

And the airside economization plan faces challenges, says Mark Svenkeson, president of Hypertect. Taking advantage of Chicago's climate in cold-weather months sounds like a great idea, but airside economization doesn't work well in the winter, said Svenkeson, whose company builds data centers. Letting in dry, below-freezing air could create a buildup of static electricity, which can be lethal to servers, he said. And humidifying the air would require exorbitant amounts of energy and might cause condensation problems – leaving Microsoft with an "ice-side economizer," Svenkeson quipped.

Michael Manos, Microsoft's senior director of data center services, acknowledged that the initial airside economization plan was overly optimistic. The company now expects to use both the air-based approach and less-energy-efficient liquid cooling methods.

Svenkeson estimated that even with cutting-edge cooling systems in place, it still takes a watt of electricity to cool a server for every watt that's used to power the system. "It's quite astonishing, the amount of energy you need," he said.

Manos disputed the universality of the 1-to-1 ratio but declined to say how much energy it would take to cool the Northlake data center.

"I won't argue that the facility isn't large by any standard," Manos wrote in a blog post. "Being 'green' assumes you are doing everything you can to ensure every last watt is being used for some useful product of work. That's our mission."

– ERIC LAI

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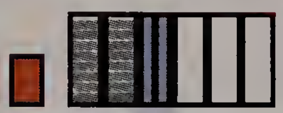

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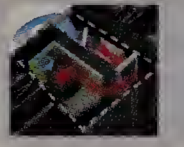

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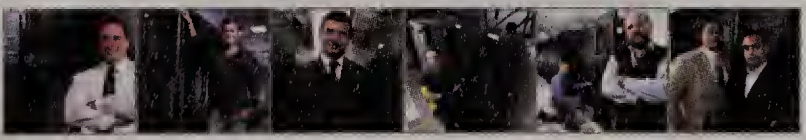

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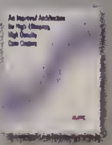

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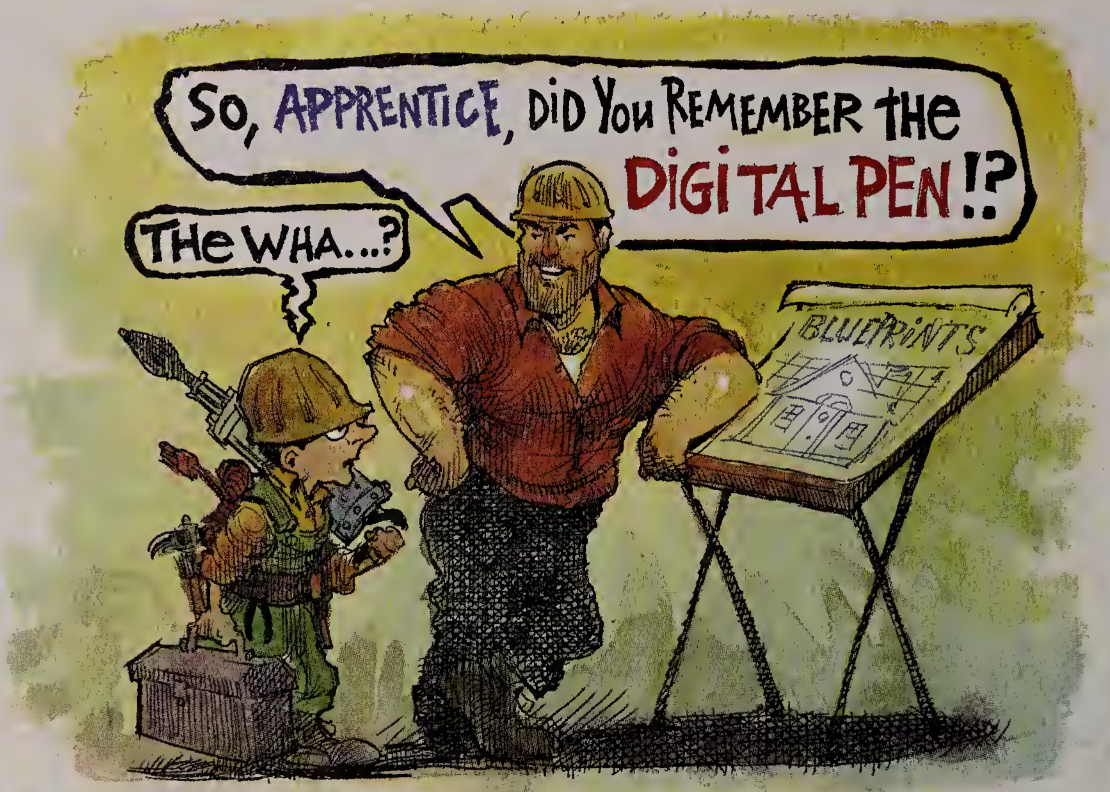
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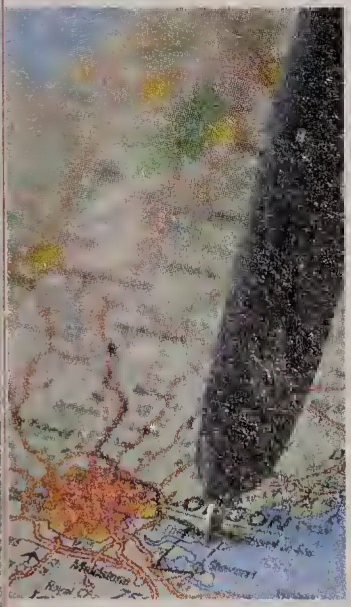
IF YOU HAVE workers in the field who need to mark up printed documents, you know that getting handwritten data into an application is time-consuming. Sometimes money is wasted and decisions are delayed while you're waiting for those files to be updated.

That's the problem that CEO Ken Schneider says his company, Seattle-based Adapx Inc., has solved with its Capturx digital pen and software package.



Adapx's digital pen can transfer handwritten comments made on paper into electronic documents.

When you print a document from Microsoft Office OneNote, Autodesk applications or GIS tools from ESRI, the Capturx plug-in applies an invisible layer of dots to the paper. When you use Adapx's digital pen to write on the document, the dots tell the pen where you scribbled your notes. Back at the office, you pop the pen into its USB dock, and Capturx opens the file and adds your commentary precisely where you made it. The software can support handwritten notes from multiple users.

Capturx starts at $349 for the Office OneNote version. In Q4, Adapx plans to ship a version for Microsoft Office. For those of us who prefer pens to keyboards, such technology offers hope.

Monitor Your SOA Business Apps

IT shops are no longer fiddling with service-oriented architecture at the pilot stage; they've rolled it out into line-of-business apps, which involve more services and much more complex deployments.

So says John Hubinger, CEO of AmberPoint Inc. in Oakland, Calif. That's why the company is adding a feature for monitoring business transactions to its AmberPoint SOA Management System 6.0, he says. The upgrade "fingerprints" each transaction, be it an insurance claim or a stock market trade, and follows it from start to completion. According to Ed Horst, vice president of marketing, the tool detects technical hiccups and business-process errors and corrects them on the fly or sends alerts, depending on the policies you set. Version 6.0 starts at $35,000 per CPU.

Hubinger: SOA's success creates a need for transaction monitoring.

Wireless Bandwidth Is Shrinking Fast

Michael Manzo, chief marketing officer at Openet Telecom Inc. in Dublin, posits that a wireless bandwidth crisis is nigh.

The 700-MHz spectrum that was auctioned off in the U.S. in March might help a bit, but not for long. Not with products like the iPhone and mobile data users' insatiable appetite for peer-to-peer activity gobbling up bandwidth. Manzo says just 1% of mobile users consume 40% to 65% of a network's bandwidth. And data transactions are doubling about every six months, he claims.

A wireless bandwidth crisis is approaching, says **Manzo**.

How can CIOs ensure that their users' smart phones won't be useless bricks? Manzo says more spectrum isn't the answer; instead, service providers will have to offer tiered data plans. To do that, they'll need software like Openet's FusionWorks, which can assess a variety of factors about a user's rate plan, quality-of-service requirements and other conditions before beginning a download. Manzo even foresees carriers offering on-the-fly, pay-by-the-gulp services for those who have no QoS agreements. Plus, they'll be able to bill for specific services, so that it might cost more for P2P than for streaming video. Or vice versa. ■

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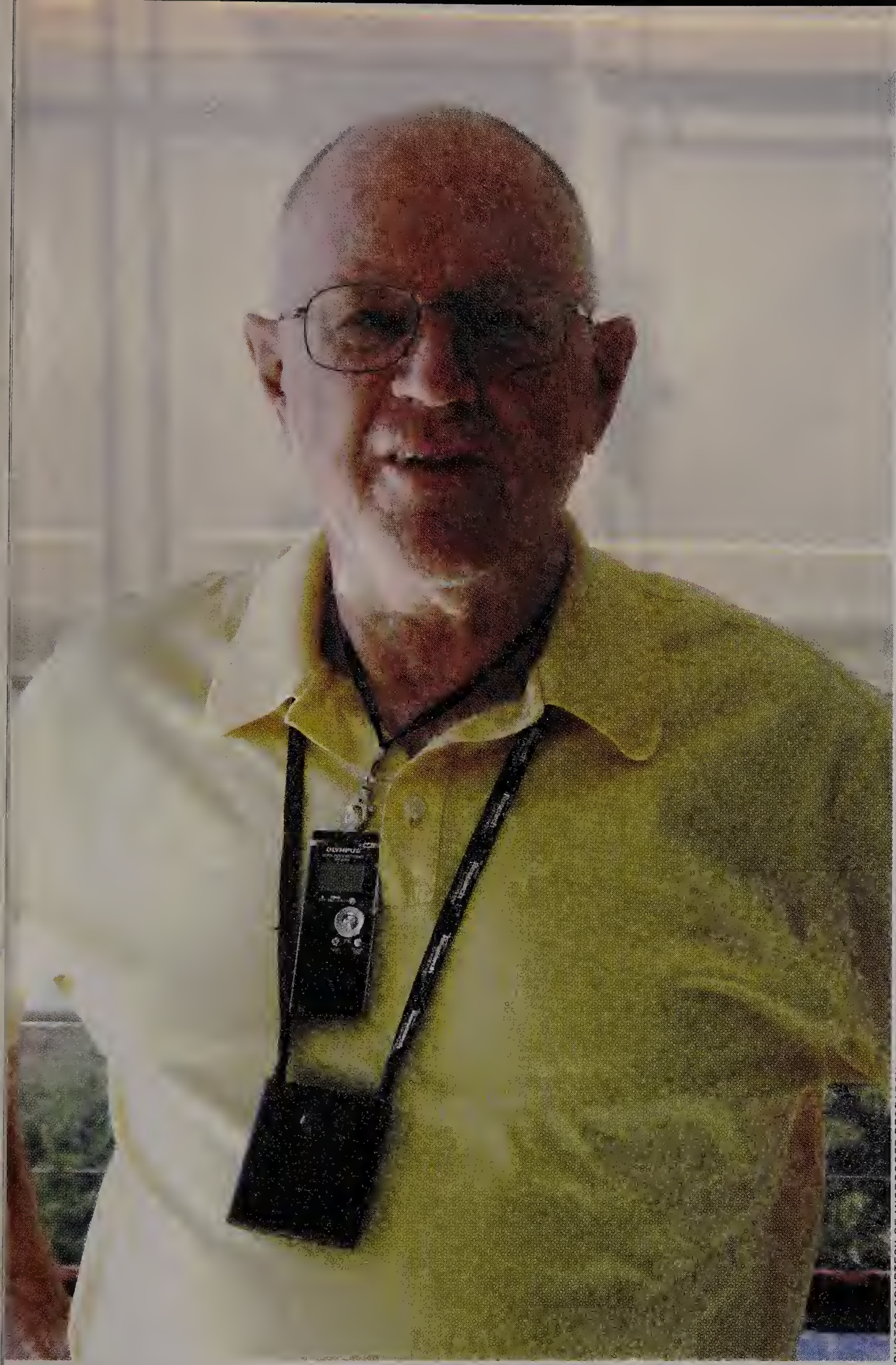

PHOTOS COURTESY OF MICROSOFT RESEARCH

■ THE GRILL

Gordon Bell

The **computer pioneer** talks about his **favorite computer** of all time, the **state of telepresence** and his good friend **Jim Gray**.

Dossier

Name: Gordon Bell

Title: Principal researcher

Organization: Microsoft Corp.

Location: San Francisco

Favorite gadget: "The Kindle, the Amazon book reader. I'm an advocate of having books electronically. I just came back from a trip. I had 150 books scanned. The Kindle is Amazon's service but also a wonderful reader. It's a paperback-size screen. I love it. "

Favorite pastime: "Web surfing or thinking about computers or reading about computers. And I have an apartment in Sydney, so I try to spend four months of the year there."

Favorite vice: "Eating too much. I'm constantly trying to control my weight."

Job outside tech he would like to try: "I don't think there are any. I look at what people do and [I] think, 'How can they do that?' I feel so fortunate that I'm doing something I like."

Gordon Bell has been working in the IT industry for nearly 50 years. He was a key engineer and vice president of research and development at minicomputer pioneer Digital Equipment Corp. for 23 years and later a founder of the Computer History Museum. Currently, Bell is a principal researcher at Microsoft Corp.'s research arm.

These days, he's working on a way for people to capture all of their life memories on their computers. The nine-year project, called MyLifeBits, has Bell supplementing his own memory by collecting as much information about his life as he can — including pictures, phone calls, e-mails and conversations.

What has been the most influential change or product that you've seen over the years? Certainly, the big bang was the integrated circuit and the microprocessor. Everything has been pretty predictable since then. It was really the integrated circuit that allowed the exponential increase in power.

Continued on page 26

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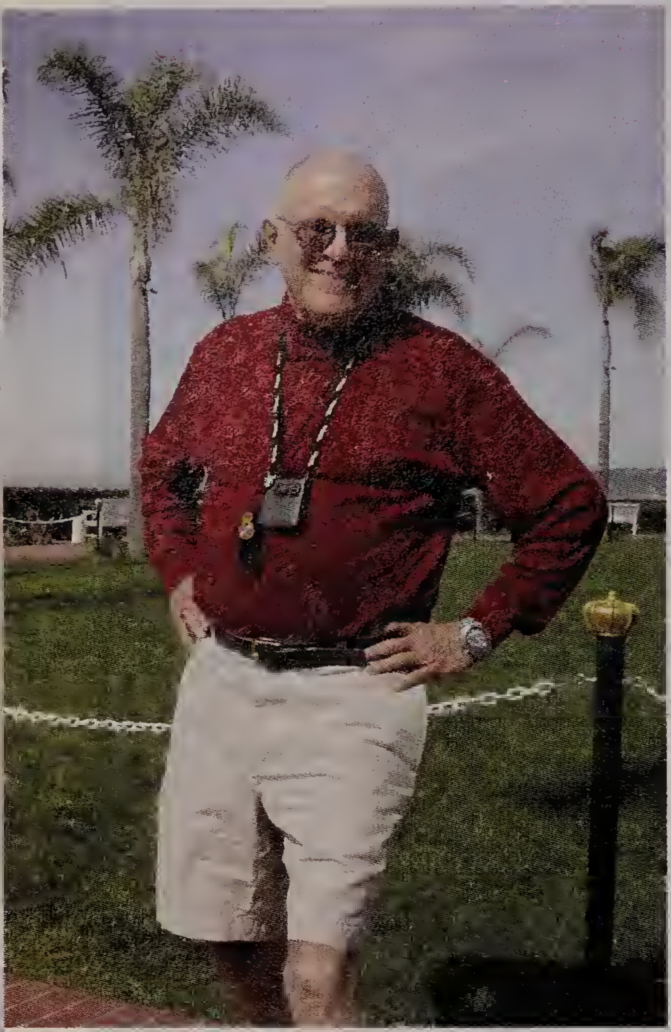

> **“To me, the most exciting time was when I was in Tahiti and wrote a paper that turned out to be the VAX strategy.**

Continued from page 23

What did you think we'd have by now that we don't? I started out in speech when I graduated from MIT. I thought we would be a little further ahead in being able to do speech recognition. Speech has been a hard one.

Which computer best illustrates the 20th century? When you take it all together, it's either the IBM [360 mainframe] or the PC. [The mainframe] was the workhorse of computers for such a long time and continues to be. On the other hand, the thing that's had the biggest impact has been the PC. The world population of PCs is in the billions. With the sheer numbers and the number of people's lives it's touched, it's probably got to be the PC.

What's your favorite computer of all time? For one that I was involved with, the VAX was the most successful one. It was a joy to be involved with. It was a wonderful team. I'm very proud of what we produced. And for one that I wasn't [involved] with — in a funny way, it's probably the IBM 360.

I love Seymour Cray's computers. OK — I'd say it's the vector processor. The Cray style of vector processor is one of the great inventions. It's certainly underappreciated by most scientists. It just computes very fast. It was the workhorse for computing from '75 to '95. It had a wonderful elegance. It really was a spectacular piece of engineering.

What was most exciting about your work on VAX computers back in the day? To me, the most exciting time was when I was in Tahiti and wrote a paper that turned out to be the VAX strategy. It was a commitment to having a small number of computers that would cover the whole of computing, from personal computing and workstations up through mainframes and central computers. That we did with clusters. It was the idea of using computers in a cluster that really was the big thing about VAX.

What was the most frustrating or disappointing part of it? I ended up with a bypass — a heart attack that I can't blame on VAX or the difficulty. It was certainly a lot of stress to get all of the machines built and get things done. There was a bittersweet joy to it. After you get all of it out there, you kind of forget any of the difficulties that you had in getting it done.

What ever happened to telepresence? I think telepresence is happening. It's slowly happening. When I went to Microsoft, we got to a certain point and said, “Gee, until the network and the IP stack and all those things get better, it will be hard to do telepresence.”

Telepresentations are the ability to give a presentation and have it multicast to a number of remote sites. We wanted to attend lectures in Redmond and have them available on the Net. Telepresence is time-shifting and space-shifting. It's like being here while being there and, potentially, at some other time. You're potentially at some other time and space. It's getting more and more common.

I make perfectly good video calls from Sydney, and we'll have several of us online, communicating in that form. I think it's kind of here and will get better.

What do you wish people knew about your friend and fellow Microsoft researcher Jim Gray? [Gray disappeared while sailing in January 2007.] He was so outgoing that people working with him all felt he was our personal friend. He's a unique individual, and if you asked 100 people, “Who's your best personal friend?” they'd all say Jim. And I don't feel bad that all those other people feel that way.

He gave me a book called *Pasteur's Quadrant*. It's about what separated Pasteur from other scientists. It's about a quest for understanding and a quest for use. Is what you're doing going to have any utility and any contributions to science? Jim was all about the use and about the understanding. He wrote great papers. As a researcher, he did his job of making his work understandable and known, and people could build on it.

What new technology are you most excited about? There are two that have come out, and we're just watching what they will do and their exponential change. The cell phone and wireless sensor networks — the ability to have radio connections with everything. It's all about where it's going. It's your entertainment center. It could be your books. As you get more and more data, the cell phone increasingly will have more onboard storage.

If there was a movie about your life, who would you want to play you? I want somebody handsome and dashing and nice and all that. Robert Redford could play me in anything.

— *Interview by* **Sharon Gaudin**

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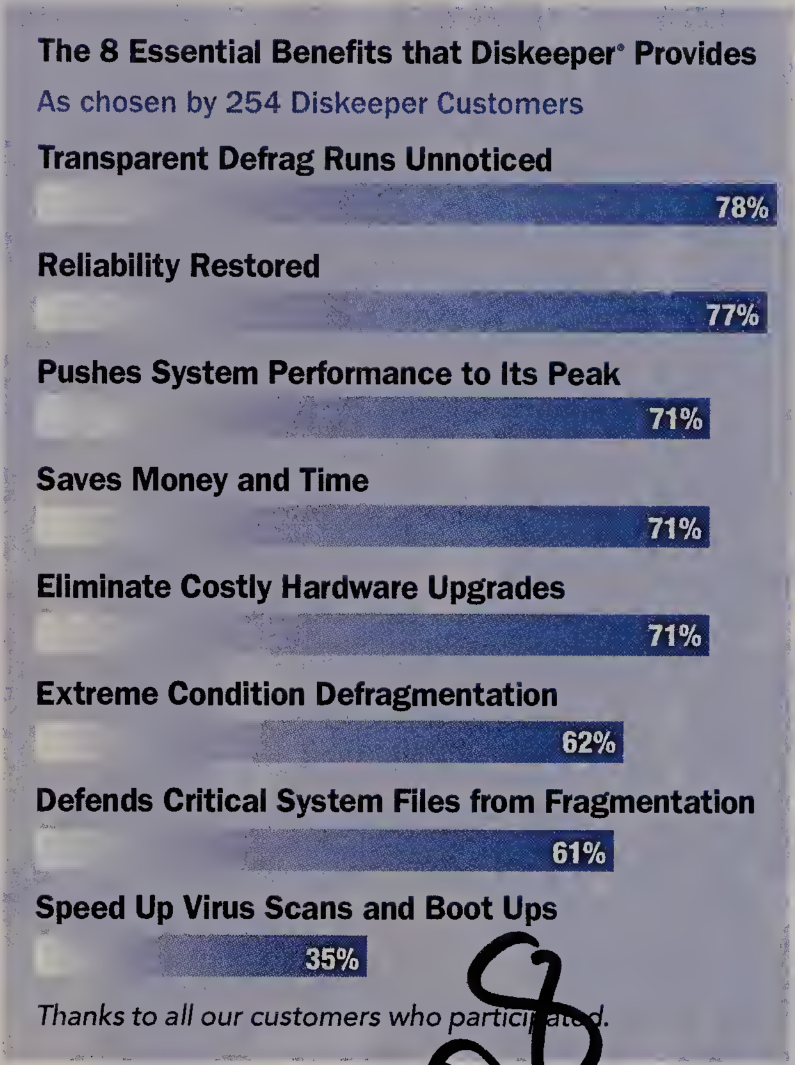

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1. PUSHES SYSTEM PERFORMANCE TO ITS PEAK

"We had one machine that had a failing drive in a RAID 5 array and when we replaced that drive, performance improved by 300%. And then when I ran Diskeeper for a week, again it improved over 300%. A disk intensive process that was taking 1.5 hours is now taking 15 minutes."

2. RELIABILITY RESTORED

"We use Microsoft® SQL Server®. We were receiving hundreds of messages per day in the log like this one: SQL Server has encountered 21 occurrence(s) of I/O requests taking longer than 15 seconds to complete on file [E:\mssql\data\...]

"We researched this error and found that it is usually caused by badly fragmented hard drives. While our drives are part of a large SAN solution, we were not totally convinced that this should be causing the problem. We downloaded a trial version of Diskeeper and after running it, all of these errors disappeared! We have purchased 5 copies of Diskeeper and we are installing them on all of our production databases with the expectation to never see this error again!"

3. TRANSPARENT DEFRAG RUNS UNNOTICED

"The server automatically defragments only when there are idle resources. No more worrying about when I can schedule defragmentation, no more worrying about if the defragmentation will cause performance issues. InvisiTasking™ has worked great for us on everything from file and print servers to SQL servers."

4. DEFENDS CRITICAL SYSTEM FILES FROM FRAGMENTATION

"I have been using Diskeeper at my office on the 63 workstations and 4 servers over the last year. The addition of Frag Shield™ 2.0 eliminates the task of manually changing the MFT. In the past most of my MFTs needed adjustment. Now that this function is automatic, I don't have to manually check it."

5. SAVES MONEY AND TIME

"Prior to installing Diskeeper, we were manually defragmenting. Some of the drives would take hours to defrag and within a few days we would need to defrag again. Installing Diskeeper basically paid for itself within a month by reducing off-hour salaries. Also the defragmented drives perform better and last longer. It's a no-brainer for production machines."

6. SPEED UP VIRUS SCANS AND BOOT UPS

"Diskeeper saves time in doing virus scans, backing up, indexing and searching the files. There are also faster download times for users because of the lower load on the defragmented RAID."

7. EXTREME CONDITION DEFRAGMENTATION

"One day our SQL Server came to a halt. I did everything: ran spyware software, deleted numerous .TMP files, ran Windows® Update, etc. But nothing got the server to run. Then I installed and ran Diskeeper; I found that the hard drive was horribly fragmented. But after Diskeeper finished defragging the system, the server came up."

8. ELIMINATE COSTLY HARDWARE UPGRADES

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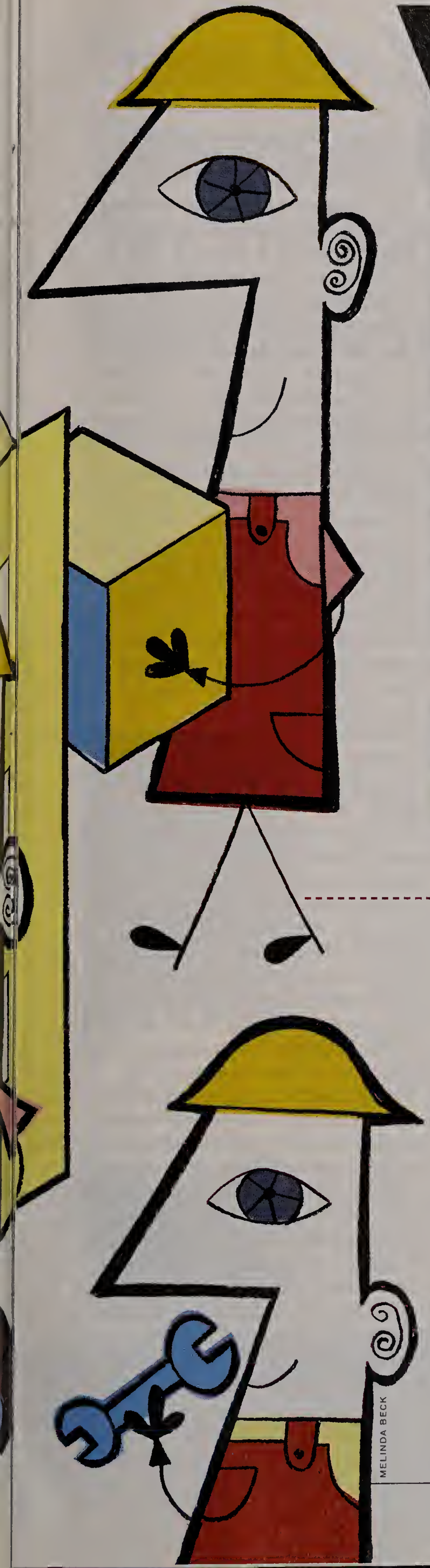

MELINDA BECK

Your Next Data Center

COMPANIES ARE OUTGROWING THEIR DATA CENTERS FASTER THAN THEY EVER PREDICTED. IT'S TIME TO RETHINK AND REBUILD.

BY ROBERT L. SCHEIER

ABOUT 15 miles from its medical center in downtown San Antonio, Christus Health is building a $23 million data center to house a flood of digital information ranging from patient insurance records to CT scans.

At 48,000 square feet (of which only 7,500 square feet will be used at first), the new facility will dwarf the hospital's current 4,000-square-foot data center, which has been bursting at the seams for years even though the IT staff has made every effort to virtualize servers and otherwise squeeze more life out of it.

"Imaging data is growing by leaps and bounds as more types of information gets digitized," says Mark Middleton, system director for IT architecture at the Irving, Texas-based health care provider. "We've done all the remediation we can but have eaten up all of the electricity, all of the cooling and all the physical space we had."

Christus Health is a prime example of why, even in a wobbly economy, many organizations are still rebuilding or redesigning their data centers.

Many need to reconfigure their IT operations to save money. Some can't afford, or get, enough electricity and cooling into their current facilities to handle rack after rack of the latest, densely packed blade servers. Others need more computing, storage or network capacity to handle new applications or to cope with acquisitions. Still others need to improve their disaster recovery capabilities.

DEMANDS UP, BUDGETS DOWN

More than half of 27 CIOs and senior IT leaders interviewed by market researcher IDC this spring reported reductions in their budgets for this year. Many also reported that they had consolidated data centers, applications and data, and IDC analyst Henry Morris says the study revealed "a significant shift toward cost reduction rather than revenue generation as a driver of IT investment."

At a Gartner Inc. conference in November 2007, more than one-third of the attendees said their newest data centers are seven years old or older, meaning they weren't designed for the power and cooling needs of today's high-density servers. Half of the respondents predicted that they would need to expand their data centers over the next three years, with many saying that they expected to go "from one to two data centers, in part to address disaster recovery," according to Gartner.

Whether they're building new data centers from the ground up or revamping existing space, data center managers are virtualizing multiple applications onto single physical servers, consolidating many data centers into one or two facilities to save on real estate and other infrastructure costs, and redesigning the physical arrangement of servers to save on cooling costs.

"We're doing a thermal heat analysis to understand where we have hot spots, and implementing hot and cold aisles" between racks to prevent cool air from being contaminated by exhaust heat, says Jim Lowder, vice president of technology at health care provider OhioHealth in Columbus.

Since starting an overhaul of its data center in 2003, the Pennsylvania attorney general's office has achieved close to "lights-out" operation of 130 servers, more than 1,000 computers and 20 offices across the state. It uses virtualized servers and remote management software to slash the time and effort required for routine functions. "We can completely rebuild a server and have it ready to roll out in about seven minutes," says data center administrator John Nester. He has also kept head count and energy use flat since 2005 while more than doubling the number of servers.

Armchair Data Center Management

THE LIGHTS aren't completely out in John Nester's data center, but there are fewer of them burning late at night and on weekends these days.

That's because remote management tools running on notebook PCs and even BlackBerries allow his staff to remotely monitor servers, networks and storage and to solve problems without going near the data center.

"We can be out of the office and check a server, reset accounts, set up e-mail or do any number of things from our BlackBerries," says Nester, a data center administrator in the Pennsylvania attorney general's office. "We get e-mails when there are power issues, when there's a cooling issue, when there's a server issue. We can take care of the situation before it even happens."

His team relies on remote access tools from several vendors, including Microsoft, Citrix Systems, Cisco Systems, American Power Conversion and Rove Inc., to monitor everything from servers and storage to power and cooling. "I can sit at home and manage the entire data center," Nester says.

– ROBERT L. SCHEIER

For his part, Richard Balentine, now the CIO at Greensboro, N.C.-based NewBridge Bank, says he had to interrupt a planned upgrade of his application infrastructure at Lexington State Bank to cope with the 2007 merger between Lexington State and FNB Southeast that created NewBridge Bank.

The original modernization effort included upgrading applications such as customer relationship management systems and bringing outsourced software back in-house. Among other upgrades, Lexington State installed its first storage-area network, an EMC Corp. system, and upgraded its network.

But in early 2007, the looming merger required Balentine to refocus on consolidating the two banks' infrastructures, which included reconfiguring FNB's data center in Reidsville, N.C., as a disaster recovery site. Consolidating and combining bank operations took seven months and included expanding the SAN and deploying new, virtualized servers using software from VMware Inc.

Creating — or reducing the cost of — a disaster recovery site is often part of a data center upgrade plan. For example, once it has moved to its new facility, Christus Health will move its disaster recovery site from an outsourcer and into its new data center.

Some vendors, as well as customers, argue that data center managers shouldn't just look for cost savings as they reconfigure their centers; they should aim to fundamentally transform how they deliver IT services.

The Pennsylvania attorney general's office has virtualized servers with VMware software, moved from direct-attached storage to network-attached storage from NetApp Inc. and upgraded its network to 10 Gigabit Ethernet. Power capacity and cooling weren't issues, since the data center was built to handle mainframe needs and is, if anything, too cold rather than too warm. Nester says he is using two-thirds less space than he did before the upgrade.

His staff can remotely and proactively deal with servers and network problems, and deliver new IT services more quickly (see story above). One example is an application that supports

Continued on page 32

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Continued from page 30

Pennsylvania's revised "Do Not Call" law, which allows consumers to register their cellular and land-line numbers. Staffers delivered the application within 45 days, on time and within budget, Nester says.

"A few years ago, that would have been an eight-month project," says Assistant CIO Jim Ingalzo.

BUILT TO LAST?

In some cases, building and design issues drive decision-making. Hawaii Pacific Health found that it couldn't bring more power into its main data center because the floor was too weak to support any more uninterruptible power supplies.

Rather than spending $500,000 to reinforce the floor, Hawaii Pacific has kept its electricity usage level by virtualizing more and more of its 300 servers, and it has moved to new blade servers whose power can be raised or lowered as processing loads change.

IT Director Colbert Seto will also upgrade the health care provider's Hewlett-Packard SANs to support the rollout of a new electronic medical record system for 3,000 concurrent users. The growth in storage demand, he says, threatens to overwhelm any cost savings he might achieve through server virtualization. Seto is counting on the eventual use of de-duplication technologies (which store only changes in previously backed-up data) to reduce future storage growth, along with new policies that reduce how much data users keep in the first place.

Some data center managers find that budgets are so tight that all they can do is play for time. That's the case for Randi Levin, chief technology officer and general manager of IT for the city of Los Angeles. Like many other IT managers, she's about to run out of power and cooling at the city's main downtown data center. But with the city facing a deficit of more than $400 million, it's unlikely she'll get the $28 million to $30 million needed to upgrade the facility — even if that was a worthwhile investment for a data center at the bottom of a high-rise building in an earthquake-prone city.

Levin says IBM is in the early stages of a study to find a way to virtualize the 600 servers in the facility down to as few as 30 or 40 physical machines. She says she hopes server virtualization will let her use the existing facility for another two or three years while she develops other long-term options.

At NewBridge Bank, Balentine believes he has created an infrastructure that could support the bank's growth to "a $10 billion organization in five years," and he says that scalability "will be a feather in our cap when we have the opportunity to acquire other banks."

Middleton hopes his new building will give Christus Health room to grow for the next 10 to 15 years.

For various reasons, and within a range of time frames, the push is on to revamp data centers to save money in the short run — and build new ones to increase efficiency and effectiveness in the long run. ■

Scheier *is a freelance writer in Boylston, Mass. You can contact him at bob@scheierassociates.com.*

WHAT'S IN YOUR DREAM DATA CENTER?

We asked IT executives and industry experts to dream big and tell us about their ultimate wish lists for a brand-new, built-from-scratch data center – if money were no object. Here's what they had to say:

■ **RODNEY McPEARSON,** *project manager for data center build-outs, Cimarex Energy Co.:* McPearson's dream data center would have raised floors and plenty of power – preferably from two different suppliers of electricity, as well as a backup generator in case both of the suppliers failed. It would also have plenty of cooling and lots of connectivity.

■ **JOSHUA AARON,** *president, Business Technology Partners LLP:* "I would have nearly infinite bandwidth and resiliency; I would have multiple providers and multiple carriers so we would have an unlimited supply of bandwidth available to us. I would implement the latest and greatest in blade server technology and server virtualization to try to maximize the consolidation of the equipment.

"I would have at least four hours available to me on UPS power for the entire data center, and backup generator systems that could provide me with at least two weeks of continuous runtime. Also, I'd want at least a 36-inch raised floor and the ability to run all of my cooling through the floor, in addition to providing outlets for all of my cables. I would want all of my telecommunications cabling to be on a modular infrastructure and have more than enough fiber and copper feeding every equipment cabinet."

■ **BILL MAGUIRE,** *CIO, Virgin America Inc.:* Maguire's wish list would include redundant communications, two separate power sources and a secure building. He would nix raised floors in favor of overhead wiring and cooling, and he would have two entrances. Location isn't as important to him; Maguire says it "only matters from a perspective of telecommunications and skill set – everything else, I can get to the building."

■ **TROY TOMAN,** *vice president of operations, Rackspace Hosting:* "The ultimate in redundancy is the first thing that comes to mind. There are technologies that you can take advantage of that can basically leave no single point of failure at all in the data center. 2N is the ability to cover any failure in the data center. If you could do that at the same cost as you can currently build an N+1 environment, that'd be the first thing that comes to mind. Second would be if you could take advantage of some of newer green ideas, without any of the inherent risks that come with those, such as flywheel's short power life."

– PATRICK THIBODEAU AND STACY COLLETT

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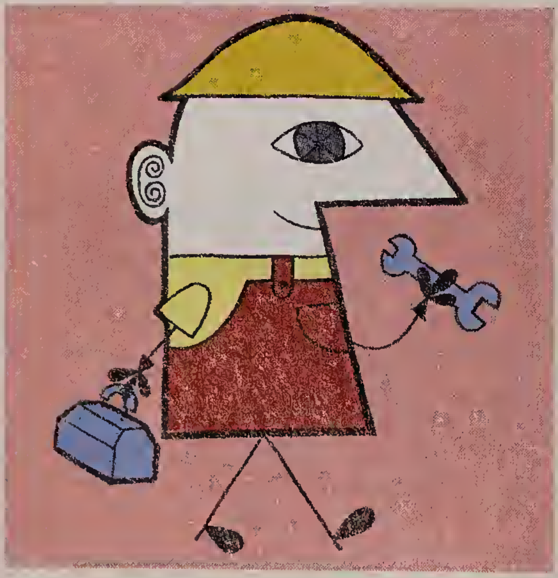
THE Master Plan

HOW TO MANAGE FIVE KEY ASPECTS OF YOUR NEXT DATA CENTER



MELINDA BECK

How to Build It

BY STACY COLLETT

TODAY'S data centers pack more processing power into smaller physical spaces than ever before. But too much of a good thing creates new challenges for next-generation data center design.

Consolidation has decreased the physical footprint but has created new power and cooling challenges. Ten years ago, data centers used 30 to 50 watts of power per square foot. Today's data centers gobble 150 to 225 watts per square foot, according to research firm DatacenterDynamics in San Francisco.

"That number is going up steadily," says Joshua Aaron, president of Business Technology Partners Inc., a New York-based consultancy. "Blade servers and virtualization allow you to pack all this into a data center, and it requires more power for that equipment."

What's more, because data centers hog power and cooling resources, there's a big push to design them in a more energy-conscious way — with recycled materials, raised floors for maximum cooling efficiency, and alternative natural power sources.

Add to the mix a need for complete redundancy in uninterruptible power supplies, and data center designers face a delicate, ongoing balancing act.

"I think the ultimate goal is to develop and operate a data center where you maximize the utilization of power within a given space for the lowest life-cycle cost without sacrificing reliability," says Jeff Monroe, executive vice president of strategy and business development at DuPont Fabros Technology Inc., a data center provider in Washington.

When building your next data center, your best bet is to be flexible and keep an eye on your company's future needs. Here are some goals to keep in mind.

PLAN FOR MAXIMUM EFFICIENCY

Equipment must be configured in a way that is efficient to operate and maintain, Monroe says. "Space plans must allow for the efficient deployment of servers such that the end user can consume as much of the available power as possible while still optimizing heat transfer and rejection," he says.

Raised floors and efficient cooling and heat flow are helping with power efficiency.

Managed hosting provider Rackspace Hosting builds its new data centers with raised floors so cool air under the floor can be pulled up through the room and hot air can exit from the ceiling. Overhead air conditioning ducts require larger fans and water pumps and, consequently, use more energy. "In one of our data centers, we forecast as much as a 10% to 15% efficiency improvement by

Continued on page 36

MORE THAN 80% OF IT PROFESSIONALS BELIEVE THAT INTERNET THREATS WILL BE WORSE NEXT YEAR, AND SPAMMERS AND CYBER CRIMINALS ARE GETTING SMARTER AND MORE DIFFICULT TO BLOCK.*

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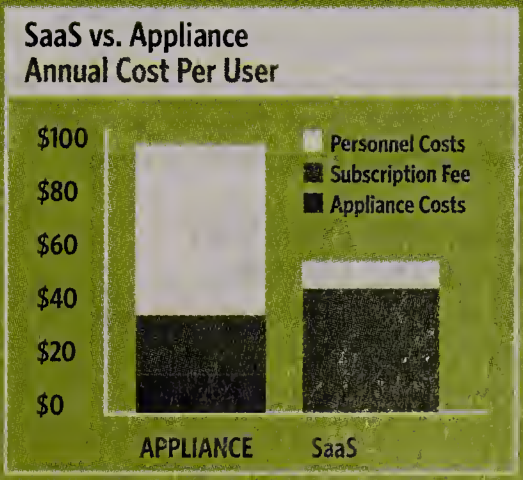

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> **“Keep flexibility in the system so you don’t lock yourself in. You’re talking about a data center that you’re hoping is going to be around for 20 to 30 years.**
>
> **TROY TOMAN,** VICE PRESIDENT OF OPERATIONS, RACKSPACE HOSTING

Continued from page 34

moving to an under-floor model,” says Troy Toman, vice president of operations at San Antonio-based Rackspace.

Pod designs will also help data centers adapt to new technologies and customers’ changing needs. Rackspace has eight data centers worldwide, with a 65,000-square-foot facility opening in London this year.

“We try to take a just-in-time provisioning mode,” Toman explains. Only a 20,000-square-foot portion of the London data center — or one pod — will open initially, he says. “In a year or two, when we need that next portion, we can re-evaluate the design decisions, and if there’s a better way to design or do cooling, we’ll do that,” he says.

“Keep flexibility in the system so you don’t lock yourself in,” Toman adds. “You’re talking about a data center that you’re hoping is going to be around for 20 to 30 years.”

Rackspace plans to use barriers, panels and curtain-like dividers to keep hot air that’s vented from servers away from cool air. But Toman also wants to regulate the temperature through the use of sensors that will, for instance, make sure that server areas are kept cooler than cabling areas.

DESIGN FOR EFFICIENT POWER AND COOLING

Your next data center should feature power-saving technologies. DC power is one option to consider

DC is an efficient alternative to traditional AC power, but several issues have kept it from being widely adopted. Among other things, DC power is potentially more dangerous than AC power because the voltage remains high instead of alternating according to need, Aaron says. It’s also expensive to implement. “Not all [equipment] manufacturers offer DC power options, and it’s expensive to buy a DC power rectifier,” he adds. “But the cost over time will start to come down.”

EXPLORE ‘GREENER’ OPTIONS

Data center designers are also weighing the benefits of flywheels vs. batteries as sources of backup power.

“Flywheel is much greener — you’re not disposing of batteries, and it has a clear ROI for not having to do battery replacement,” Toman says. One drawback is that today’s flywheels provide less than a minute of power.

“If everything works as designed, that’s enough time for you to power the equipment to bring on the generator,” he says. “But experiences show that eventually something won’t work as predicted. If you’ve got 30 seconds, it had better work perfectly. If it doesn’t, you just lost the whole backup computer.” Toman suggests re-evaluating flywheels as the technology improves.

SEEK OUT RENEWABLE POWER SOURCES

Experts suggest looking at renewable power sources, like the sun, wind and timber, when you’re building your next data center. Rackspace’s U.K. data center is being supplied by a utility that burns wood chips to produce energy. San Antonio, the site of another new Rackspace data center, is one of the leading locales for wind-based power generation in the U.S.

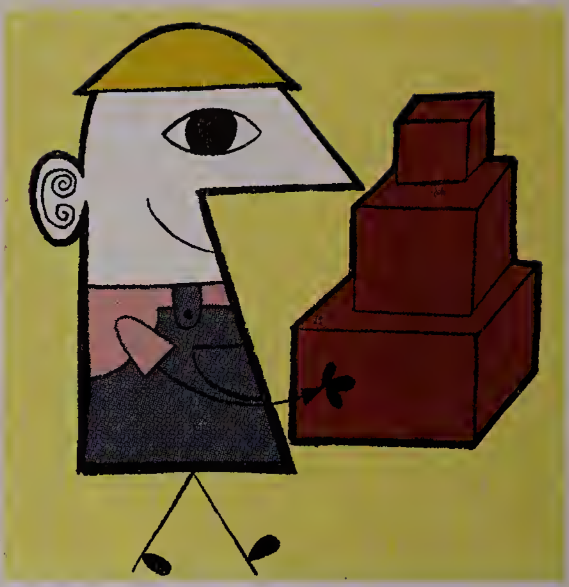
Tomorrow’s data centers will also have “2N” backup designs, in which each uninterruptible power supply has its own backup UPS module.

PERFORM A BALANCING ACT

Too much of a good thing can diminish efficiency returns, experts caution. Continually weigh the benefits of smaller footprints vs. cheap real estate, and power costs vs. alternative energy sources.

“I really do not see this as a destination but more of a journey,” Monroe says. “As technologies change, we continually look for opportunities to refine [the data center].” ■

Collett *is a* Computerworld *contributing writer. Contact her at stcollett@aol.com.*



MELINDA BECK

How to Move It

BY STACY COLLETT

AN IT guy walks into a bar . . .

No, it’s not a joke, but Ken Jamaca, president of Silverback Migration Solutions Inc., can look back on this true story and laugh.

His team was moving a data center to a new location. “Since the move was happening after-hours, the loading-zone hours had long since elapsed, and that curb space was open to general public parking,” says Jamaca. “When we arrived, the loading zone was full of cars parked by partygoers from a bar across the street. I walked through the bar ‘shoulder-tapping’ to find out who owned those cars and offered to pay for parking in a lot around the corner so we could park our truck in the loading zone.

“Forty-five minutes, over $100 in parking and three rounds of drinks [for bar patrons, not Jamaca] later, we were able to park our truck in the now-empty loading zone,” he says.

In an era when there’s absolutely no tolerance for system downtime, that’s just one example of the great lengths that data center movers will go to on behalf of their clients.

“The biggest challenge is maintaining 100% uptime” when moving data centers, says Joshua Aaron, president of Business Technology Partners Inc.

Continued on page 38

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Continued from page 36

in New York. Five years ago, movers could pull the data center plug on Friday night, move it over the weekend and plug it back in on Monday morning. "Now, there is no real acceptable time," Aaron says.

But new technologies are helping data center movers speed up the process — and improve efficiency at the same time. Here are three tips for a successful data center move.

STRIVE FOR ZERO DOWNTIME

With the cost of bandwidth becoming more affordable, "we can build a new data center in parallel" with the old center, Aaron says. "We're designing a network in the data center, and we're migrating applications between equipment in the new data center, then doing a cutover where there's no disruption," he says. That's possible because of the speed with which data can be moved without someone having to physically pick up equipment and relocate it, Aaron adds.

"There still is a chunk of equipment that gets relocated," he says, "but those tend to be systems that are backed up — things that are not production or customer-facing."

TAKE TIME FOR IMPROVEMENTS

Moving a data center is also a good time for cable upgrades — an inexpensive way to improve the performance of existing systems, Jamaca says. "A lot of companies go from Cat 5 to Cat 6, or to 10 gig cabling from 1 gig cabling," he says. That's where planning comes in. A good migration takes months of planning for hours of work — not only to determine the most efficient setup, but to find out how proposed upgrades will affect the data center from an operational and cost perspective.

SEEK PROFESSIONAL HELP

If you need to move data center equipment, Jamaca recommends hiring professionals who have the proper gear for handling fragile electronic equipment. As for the loading zone, he has this advice: "Ask the facility to put cones out [at the end of the day], or have your guys park their cars in the zone beforehand." ■

MELINDA BECK

How to Pay for It

BY PATRICK THIBODEAU

THE FIRST STEP in building a data center is learning to deal with sticker shock. New data center space costs at least $1,500 per square foot to start, according to IDC. That means IT managers will first be asked this ROI question: Are you getting all that you can out of the data center space that you have?

There's a lot of technology available that can help you pack more equipment into a seemingly shrinking data center. But if an inadequate data center is impeding business growth, "that becomes a much greater cost than anything you can outlay on building a new data center," says Michelle Bailey, an analyst at market research firm IDC.

Once a decision is made to build, the IT manager must negotiate with vendors to get the best deal. And the old rules apply: The more you're buying, the more leverage you have. And new data centers mean a lot of new equipment. Here are some other tips for getting your money's worth from a new data center.

MINIMIZE THE EQUIPMENT

Denser equipment that takes maximum advantage of computing power can "in many cases dramatically reduce the footprint required to support the applications [a company maintains] today," says Lee Kirby, vice president and general manager of Lee Technologies Inc., a Fairfax, Va.-based data center development and management firm.

"A smaller footprint equates to less maintenance and cost of ownership," says Kirby. Yet, even with new construction, the battle to control cost and maximize the investment is never-ending. Sam Segran, CIO at Texas Tech University in Lubbock, is finishing a 1,000-square-foot data center expansion and is already worried that it won't be enough to meet the university's needs in six or seven years.

"We have two diametrically opposed things happening," says Segran. "On one side, we are getting crunched by cost issues of providing [cooling and power], and on the other, we're needing to double what we do for the researchers."

The university is looking at technologies that provide more computing power using less energy. One is IBM's new iDataPlex, which includes 84 servers built into a 42U rack (1U is equal to 1.75 in.). Due out this June, the iDataPlex is a dense system that cuts power use in several ways.

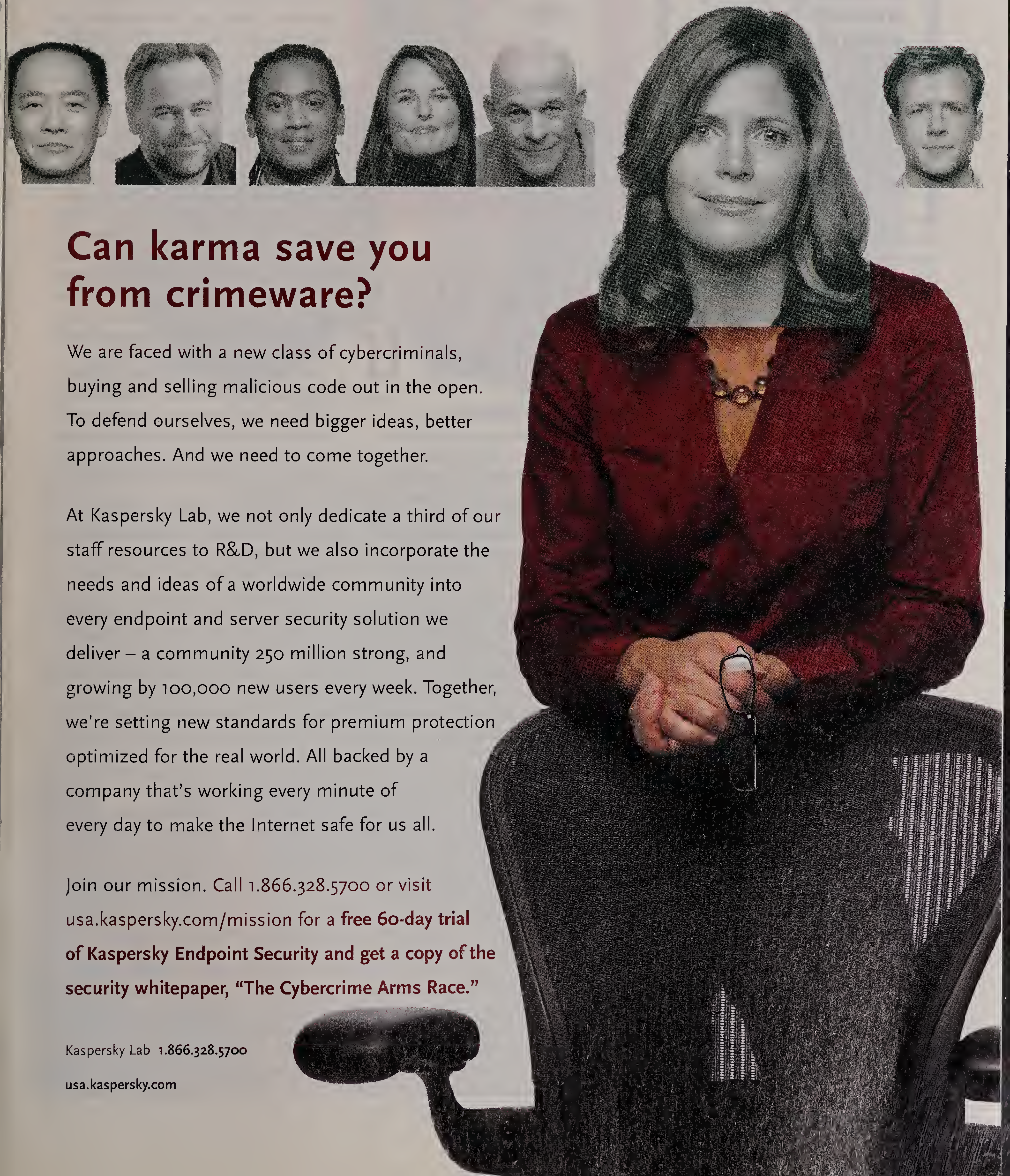
For example, using servers of less depth lessens the workload of cooling fans. Preliminary research by the university's IT department found that the system might be able to provide 30% more computing capacity using the same amount of power as a current system.

MAXIMIZE THE SPACE

At Denver-based Cimarex Energy Co., data center project manager Rodney McPearson focused on improving his IT systems after the company decided to run a series of small, distributed data centers. Last year, Cimarex installed an American Power Conversion Corp. in-row cooler system that creates an enclosed area for servers. McPearson says it costs roughly $1,000 a month for the system to cool about 90 servers. In contrast, a conventional cooling system in another room chills a similar number of servers for $2,500 a month.

At Virgin America Inc., CIO Bill Maguire says he maximizes the use of space and saves money through a variety of means, including eliminating raised floors and using water-cooling

Continued on page 40



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> **“On one side, we are getting crunched by cost issues of providing [cooling and power], and on the other, we’re needing to double what we do for the researchers.**
>
> **SAM SEGRAN,** CIO,
> TEXAS TECH UNIVERSITY

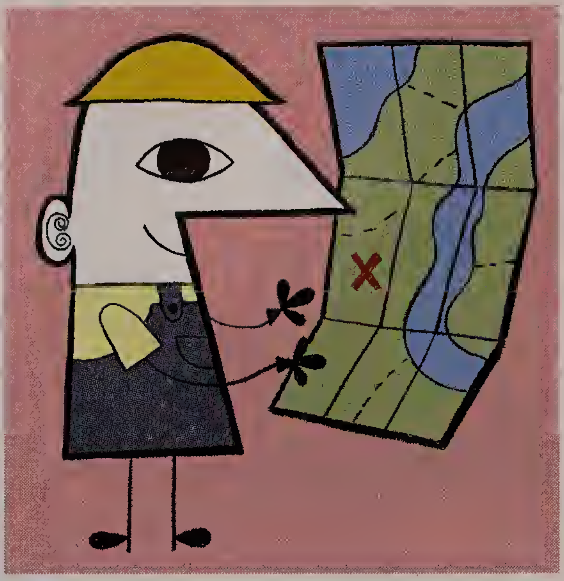
Continued from page 38

systems from Liebert Corp. that cool from above instead of blowing air up from below. He says his choice of energy-efficient blade technology from Verari Systems Inc. was critical as well. This approach has cut his energy cost by about 27% total, Maguire says.

MAKE USE OF MOTHER NATURE

Microsoft Corp.’s new 500,000-square-foot data center in Chicago will use cooling systems that take advantage of the abundant natural sources of cooling in the Windy City. The technologies are called airside and waterside economizing systems, or “free cooling.” Airside economizers use outside air to cool data centers. Waterside technology takes water from a natural source such as a stream, pond or river and brings it in contact with pipes carrying heated water out of the data center. The outside water cools the water in the pipes, which then recirculates back into the data center. Carl Cottuli, vice president at APC’s data center science center in West Kingston, R.I., estimates that economizers can cut utility bills by as much as 30% on the days that they are used.

Technology can mitigate the need to find an ideal location. If you can pack computing power into denser systems that use less power and also find ways to tap alternative sources of energy, then taking a step such as, say, building a data center next to a hydroelectric dam might become less important. For instance, a developer that’s building a data center in Fall River, Mass., intends to build two wind turbines that could supply 20% or more of the planned 120,000-square-foot facility’s power. ■



MELINDA BECK

Where To Put It

BY PATRICK THIBODEAU

IF DATA CENTER LOCATION was paramount to Rodney McPearson, a data center project manager at Cimarex Energy Co., he wouldn’t have two of his five data centers in the hurricane-prone locales of New Orleans and Houston and a third in the tornado hot spot of Tulsa, Okla. But geographic diversity is a big deal to McPearson, so instead of consolidating to a single facility in a safe location, his company decided it was better off keeping its servers spread out.

And what attracted Virgin America Inc. to Burlingame, Calif., when the airline built its data center there two years ago? Was it the threat of earthquakes? The high cost of electricity? No, it was the price and availability of space in its Burlingame corporate headquarters — space leased at a low rate during an earlier economic downturn, says Bill Maguire, Virgin America’s CIO.

Let’s face it: If data center location mattered, the San Francisco Bay Area wouldn’t have one of the highest concentrations of data centers in the world.

Some companies have the ability to build data centers in areas that are geologically stable, are hurricane- and tornado-free, and have low-cost power and skilled labor available. In short, they can behave just like Google Inc. and build a data center wherever they want to.

But for most IT managers, pulling out a U.S. map to pick the best spot is akin to playing fantasy football. The job of most IT managers is to make the best of whatever environment they must run their data centers in, because they might have no say in picking. But if the choice is yours, here are some tips for getting the best spot.

GATHER THE TAX EXPERTS

There’s the ideal location, and there’s the most cost-effective location, and tax breaks can have a major influence on where a data center is established, says Mark Levin, senior partner at Metrics Based Assessments LLC, a data center benchmarking and consolidation firm in Milford, Conn. When selecting a location for a data center, “what it really comes down to is, who is going to give me the best tax breaks?” he says.

Most companies don’t have to shop for those deals. For sure, some locales advertise tax incentives, but local and state governments compete aggressively for the data centers that can provide jobs and pay taxes. Custom tax deals are the norm.

For example, when The Hartford Financial Services Group Inc. needed a new data center, its message to its home city of Hartford, Conn., was, “We can stay, or we can go.”

The city worried that the company, its data center and its IT jobs would leave, says Mark McGovern, who heads Hartford’s Department of Development Services. “The cost of investment in the inner city is higher than in other places,” he says. Hartford offered tax incentives worth $13.6 million, and the financial services firm decided to build a new 31,000-square-foot data center there. “Without this assistance, we wouldn’t be getting a $100 million investment and the retention of some 600 jobs,” says McGovern.

Any discussion of data center location will involve a wide cast of characters, including real estate and facilities managers, financial officers and, especially, attorneys for finding and negotiating the best tax deals. But the choice isn’t based solely on tax breaks. It isn’t uncommon for a business to make a location decision based on zoning changes, approvals of new roads

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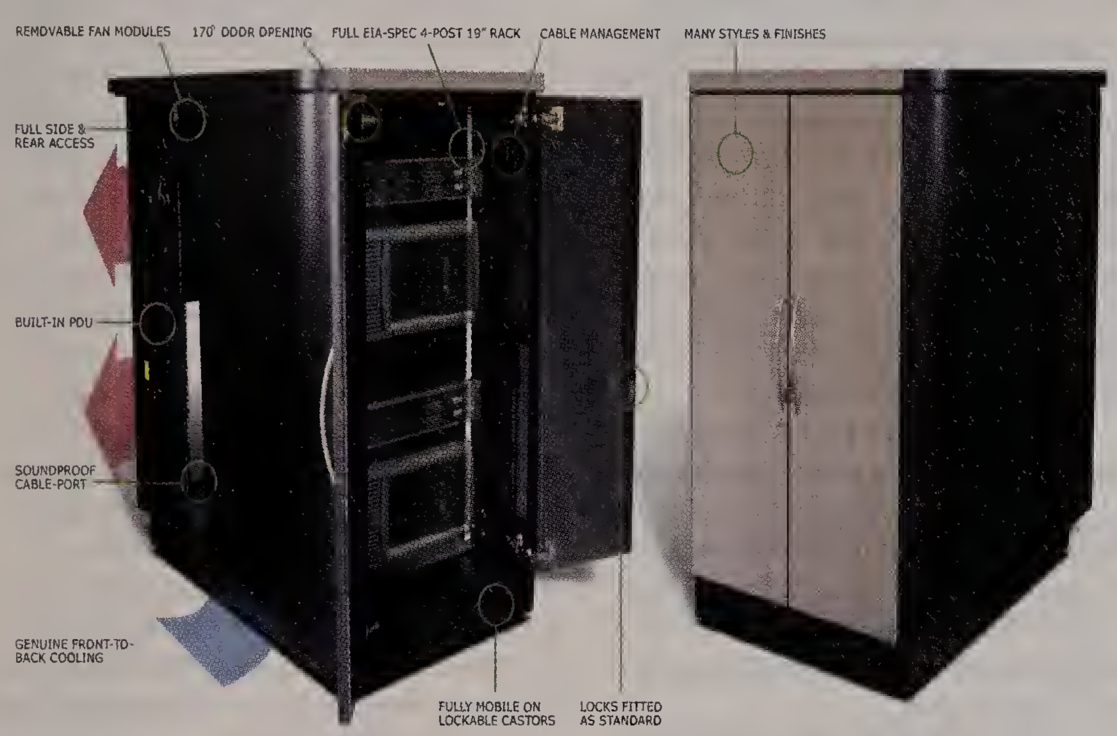

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Continued from page 40

and traffic lights, or prompt processing of building permits.

But being as big as Google helps. In the summer of 2006, North Carolina adopted a state law that gave a sales tax break to any company spending $250 million or more on a data center. Some six months after that law took effect, Google announced the opening of a $600 million data center in Lenoir, N.C., that employs 200 people.

SHARE THE SPACE

Taxes may be a major consideration in a data center location decision, but so is proximity to headquarters. Consider, for instance, IT managers who use collocation services.

Collocation firms offer data center space and can manage the customer's physical equipment; meanwhile, the customer can manage its servers remotely. A customer might own its own equipment, or lease it and contract for management services. Whatever the setup, its users can access the systems from any location, giving the customer a lot of geographic flexibility.

Alex Bitoun, CIO at Houston-based health care provider Diabetes America Inc., uses the collocation services of CyrusOne Networks LLC. CyrusOne's facilities are only a 10-minute drive from his office, and that's the way he likes it.

Bitoun turned to a collocation provider because the cost of building, managing and securing a data center was too high.

From a technical point of view, the distance to the collocation facility shouldn't matter, says Bitoun. "We can pretty much do everything remotely," he says. And CyrusOne technicians can address any physical problems that his servers may have. "But there is something comforting about knowing that it's just a few miles away," says Bitoun. Proximity to the collocation provider mitigates risk by giving his technicians the ability to easily check on equipment. It also allows him to have face-to-face meetings with the provider.

FIND THE FASTEST HUB

But having a data center service provider near corporate operations can matter for pure technological reasons as well. Don Goin, CIO at Santander Consumer USA Inc., a Dallas-based automotive financial services firm, also had options when it came to choosing a location for his data center. He selected Terremark Worldwide Inc., which is based in Miami but also has facilities in Dallas.

Terremark has a network access point in Miami that's used by telecommunications carriers as a hub, and because of that, Goin says he considered Miami as primary base for his data center operations. But Santander's call center would have to connect to Miami via a LAN, whereas it could use a much faster Metro Ethernet connection to Terremark's Dallas facility.

"Metro Ethernet vs. LAN makes a big difference," says Goin. If Santander used Web-based interfaces exclusively, the distance wouldn't matter, but the company uses fat clients and a combination of applications delivered via a Citrix presentation server and an application server.

In the end, Goin says, he chose to use Miami as a disaster recovery site, not a primary data center site. ■

MELINDA BECK

How to Staff It

BY PATRICK THIBODEAU

THANKS to technology, it doesn't take a whole lot of people to run a data center. With new remote-management and automation capabilities, you need fewer data center staffers. For instance, Microsoft Corp. will staff its 500,000-square-foot Chicago data center with only 35 people.

And at Virgin America Inc., CIO Bill Maguire is using an India-based remote infrastructure provider to manage his operations during overnight hours — and he's doing it at a big cost savings. Maguire says the full-time annual salaries of network, database and applications administrators to manage those systems overnight in the U.S. could run as high as $90,000. Instead, he pays $17 to $20 an hour per person to have his systems run remotely. The U.S. staff handles operations during the day.

But there is one area of expertise that is in high demand in U.S. data centers: virtualization technology skills.

Over the past year, the number of active advertisements on the Dice.com job site seeking people with skills in VMware virtualization tools has gone from a few hundred to more than 1,500, says Tom Silver, Dice Inc.'s senior vice president of marketing and customer support. "This is among the fastest [growth] we have ever seen" for a specific skill, he says.

Some virtualization help-wanted ads seek people with three to five years of experience in a technology that five years ago was still rare. The pool of experienced administrators is still relatively small. Consequently, while pay appears to start at $60,000 for a systems administrator with some VMware experience, salaries of $80,000 to $100,000 are also being advertised.

USE BOTH KINDS OF GREEN

When recruiting people with virtualization expertise, it may help to prove that your company cares about eco-friendly technology.

Six months ago, Enterprise Rent-A-Car Co. in St. Louis set up a green IT committee to explore ways to save energy. Among those on the committee was a representative of the human resources department, says Jim Miller, assistant vice president for IT.

"One of the things that we found as we recruit IT folks is that there's an interest in what we are doing to preserve the environment," says Miller. "We're finding that people are very, very much interested in this — they like the fact that a company is focused on this." ■

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Security, Compliance and Risk Management

- Ohio Dominican University, Columbus, Ohio
- Pilz, Corby, United Kingdom
- ReDE Inc. for the Department of Energy, Oak Ridge, Tennessee
- Six Flags Inc., New York, New York
- Yuma County, AZ, Yuma, Arizona

Servers and Virtualization

- Fannie Mae, Washington, DC
- Franklin & Marshall College, Lancaster, Pennsylvania
- Huntsville Hospital, Huntsville, Alabama
- Los Angeles Valley College, Van Nuys, California
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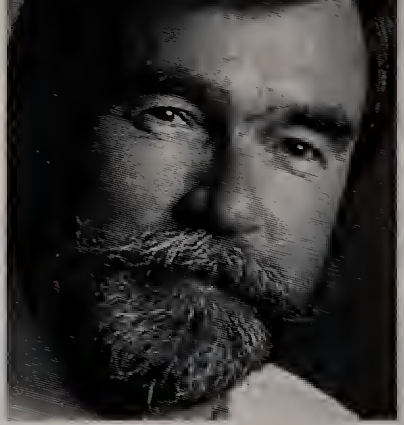
Mark Hall



Beyond the Physical

YOUR NEXT data center will be more mental than physical, more of an abstract location in your mind than a place you can show visitors on a company tour. Oh, sure, you run IT, so for the foreseeable future, it's likely there will be a server room or two that's a stone's throw from your office. But the showcase glass house days are behind us. Good thing, too.

Designing, locating, running and relocating data centers for business is damn hard work. Expensive work, too.

If you glean nothing else from the excellent selection of stories presented in this special report, you will learn that data center management is not for the faint of heart. Nor is it strategic to most businesses, which is why your next data center will be more a part of how you think, and less and less a part of the building you work in.

LESS 'THERE' THERE

IT's quick embrace of software as a service, virtualization, Web services, utility computing and other new ways to abstract and outsource operations and applications isn't just buzzword fashion. It's a fundamental shift in thinking about delivering IT to business.

No longer are you restricted to what your team, your infrastructure, your budget or your data center can handle. You can look beyond your firewall and find subscription-based resources to offload everything from simple patching and backup of your networked PCs to delivering enterprise-class applications such as general ledger, supply chain and CRM tools. You can even slap your logos on someone else's software and pretend that you did it yourself.

Yes, there's been outsourcing of software since ADP started its payroll services. And, yes, there always has been an EDS, an Accenture, an IBM Services and countless others ready to strike you a custom deal to run some of your IT goodies and offload your data center.

But today, the scale of outsourcing options and the choices of business software online is staggering. You can outsource any IT task to anywhere on the globe, and you can rent everything from desktop productivity applications to customizable ERP software.

> **If running your own data center were easy and cheap, none of this would be necessary. But it's neither.**

And you do. Survey after survey indicates that IT is getting out of the way as line-of-business managers make direct deals with SaaS vendors to get the software their departments want.

More studies show that IT is racing ahead with server virtualization projects to consolidate machines in the data center. And IT shops themselves are outsourcing more operational management duties to third parties with large, centralized monitoring centers.

If running your own data center were easy and cheap, none of this would be necessary. But it's neither. So, CIOs must fully grasp the reality that every IT demand that must be met can't be fulfilled by shoehorning more resources inside the shrinking corporate data center. You need to know when and what to let go.

Still, just because the people doing IT work aren't on your payroll, that doesn't mean you can be oblivious to what they do. Now more than at any other time in IT history, CIOs must clearly understand how IT works for the business. And you have to be able to effectively communicate your understanding to those up and down a company org chart.

Today, you need to have a mental picture of how SaaS-resident data mixes with corporate information systems. You need to envision how outsourced IT monitoring works with your in-house response team. You need to see how fast and far to push virtualization projects to relieve the pressures inside your physical data center. And when new projects are thrown your way, you need to conjure the resources they will require as abstractions that can go anywhere, rather than as extra burdens for your data center.

Today's data center is a layered abstraction that increasingly defies our senses. But the best CIOs can see it with crystal clarity — in their minds. ■

Mark Hall *is* Computerworld*'s editor at large. Contact him at mark_hall@computerworld.com.*

Career Watch

NO BEEF WITH THIS Internship

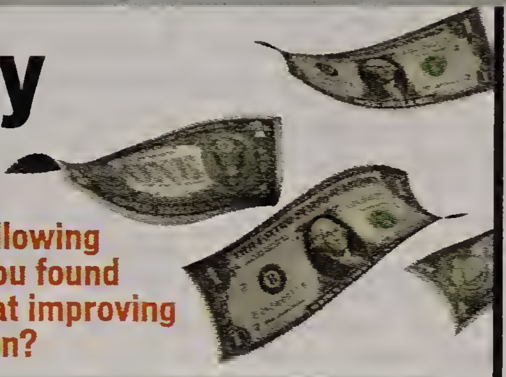
Proficient in C or C++? Have an interest in 3-D graphics development? Want to get your foot in the door of the video game industry? Well, put down that burger if you want an internship at Bigfoot Inc. In February, the San Francisco-based start-up posted a listing for summer interns with the proviso that the "vegetarian-owned and managed" company was specifically seeking software developers "who are interested in entrepreneurship and promoting vegetarianism," according to Garry Kranz in the April 8 issue of *Workforce Management*. Kranz notes that discriminating against meat-eaters may be legal, at least in California, where a court ruled in 2000 that a company could fire a vegan for refusing to submit to a vaccine because veganism is not a religious creed. Presumably, that ruling would apply in this case, although in reverse.

29% vs. 23%

Percentage of U.S. employees who ranked work-life balance as the No. 1 factor in weighing job offers, compared with the percentage who said compensation is the primary consideration.

SOURCE: HUDSON SURVEY OF 1,634 WORKERS WHO HAVE BEEN WITH THEIR CURRENT COMPANY FOR LESS THAN FIVE YEARS, JANUARY 2008

Money Talks



Which of the following benefits have you found most effective at improving IT staff retention?

Increasing compensation	27%
Providing professional development/training	21%
Offering flexible schedules	18%
Letting employees telecommute	7%
Providing extra vacation days or time off	6%
Granting company stock or options	2%
Other	1%
None	7%
Don't know	11%

SOURCE: ROBERT HALF TECHNOLOGY SURVEY BASED ON TELEPHONE INTERVIEWS WITH 1,400 CIOs ACROSS THE U.S., APRIL 2008

PAGE COMPILED BY JAMIE ECKLE.

■ **CAREER DEVELOPMENT**

Teaching IT the 'M' Word

That's 'M' as in 'marketing'

By Carolynn Benson

We live in a world where perception matters, and this is particularly true for IT, which often needs to increase its credibility, build partnerships and improve its image. For many IT professionals, promoting the work they do requires a dramatic change of mind-set. But contrary to popular opinion in IT, marketing is not about hype and empty promises; it's about creating an awareness of IT's value. Here's a six-step plan for doing just that.

STEP 1: Market internally, to IT. IT professionals need to buy into the fact that marketing is part of their job. They need to become "hallway marketers," which means speaking positively about IT – in the hallway, elevator, parking lot and so on. One company I know published a brochure with a vision statement and foundation principles to remind staffers to engage in such communication.

STEP 2: Build partnerships. This can be accomplished through both casual interactions and formal approaches. Examples include practicing active listening, expressing empathy, taking ownership of projects and visiting clients in their work areas.

STEP 3: Differentiate yourself. Clients have different business drivers and motivators, and IT needs to package its day-to-day communications, business cases and marketing plans in those terms.

STEP 4: Establish credibility. This requires an assessment of the level of trust a client has in IT so that any problems can be addressed. A simple questionnaire can expose issues, such as whether IT is professional and courteous and whether it provides alternatives to problems.

STEP 5: Create product/service awareness. Before you can market IT's strategic value, you need to promote what IT already offers. Some IT organizations stage open houses to educate employees on the services they provide, reinforcing their message with pamphlets, key phone numbers and tips on how to solve common computer problems.

STEP 6: Develop a formal plan. There are many factors to consider in developing a marketing plan, such as the overall goal, risks, assumptions, awareness programs, tag lines and challenges that might impact success. Put the plan in writing so you have a well-thought-out marketing strategy or even a checklist that the entire team can embrace.

Benson *is a senior consultant at Ouellette & Associates Consulting Inc. in Bedford, N.H. She is also a co-author of the book* The IT Professional of the Future, *due out this year.*

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TRUE TALES OF IT LIFE AS TOLD TO SHARKY

Just Like You Asked

It's the late 1990s, and this server room runs smoothly with dozens of Unix servers. Then word comes down from management: We need a Windows server. Why? asks lead sysadmin pilot fish. No answer – and fish won't budge without one. Finally, he's told it's because they need a shared drive for a few Windows PCs. "Ah! If only they'd said that earlier," fish says. "We partition off a small portion of one of our 'general use' Unix servers, install Samba and configure it, and all the Windows users suddenly have a reliable shared drive." Meanwhile, as ordered, fish installs the Windows server – on top of a cabinet and running, but not connected to the network. Managers come in for a tour of "their" Windows server, see that it's there and never return. "The box crashes once in a while – it's not actually doing anything, but it still crashes – so we just reboot it when we notice," says amused fish. "Since it's not officially monitored, it doesn't count in our downtime stats. Far as I know, it's still there, wasting electricity. But it's what they wanted."

You Never Call, You Never Write . . .

This small company has three T1 lines with a 99.999% uptime service-level agreement, says a pilot fish working there: two T1s for Internet and one for phones. But for some reason, recently all three have tended to go out at once. Each time, the telco works on the problem and calls to tell fish they're back up. And every time, not long after the call, the lines go down again – except for the most recent incident. "This last time, they were unable to get through for the follow-up call because our T1s – and thus our phone service – had already gone down again after their 'repair,' " fish grumbles. "So, what did they do? Reopen the ticket, noting that things hadn't been fixed? Or simply try calling back later? Nope. They closed the ticket and then *mailed us a letter* telling us that they couldn't get through to us by phone – but that they wanted to let us know that our service had been repaired."

Ongerstray Yptocray!

Local government office receives data from a state agency that requires encryption. "The agency sent us the encrypted data and sent the encryption key separately," says a pilot fish working on the project. "We then had to set up an automated transfer and had to create an encryption key for that part. We thought, Why not use the initial key the state gave to us? We proposed this, and the agency came back and said that key was not strong enough. This was the same key they sent to us. The wonder of government!"

■ *Keep it clear(text) for Sharky. Send me your true tale of IT life at sharky@computerworld.com. You'll get an easy-to-read Shark shirt if I use it.*

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■ COMPANIES IN THIS ISSUE

Page number refers to page on which story begins. Company names can also be searched at computerworld.com

Accenture Ltd. 44
Adapx Inc. 22
Advanced Micro Devices Inc. 9, 12
Alltel Corp. 12
Amazon.com Inc. 23
AmberPoint Inc. 22
American Power Conversion Corp. 30, 38
AOL LLC 26
Apple Inc. 6, 9
Archive America Ltd. 6
AT&T Inc. 9, 12
Autodesk Inc. 22
Automatic Data Processing Inc. 44
Bigfoot Inc. 45
Business Technology Partners LLP 32, 34, 36
Byrraju Foundation 14
Christus Health 29
Cimarex Energy Co. 32, 38, 40
Cisco Systems Inc. 14, 30, 42
Cleveland Metroparks Zoo 14
Computer History Museum 23
Cray Inc. 26
CyrusOne Networks LLC 42
DatacenterDynamics 34
Deaf Link Inc. 14
Dell Inc. 18
Diabetes America Inc. 42
Dice Inc. 42
DuPont Fabros Technology Inc. 34
EarthLink Inc. 9
Electronic Data Systems Corp. 44
EMC Corp. 30
Emcor Facilities Services Inc. 18
Emergency Management and Research Institute 14
Enterprise Rent-A-Car Co. 42
Environmental Systems Research Institute Inc. 22
Federal Aviation Administration 9
Federal Trade Commission 9
Gartner Inc. 30
Google Inc. 40
Hartford Department of Development Services 40
Hawaii Pacific Health 32
Hewlett-Packard Co. 18, 32
Hudson 45
Hypertect Inc. 18
IBM 18, 26, 32, 38, 44
IDC 30, 38
Intel Corp. 9, 12
Internal Revenue Service 48
International Electrotechnical Commission 12
ISO 12
Korea Fair Trade Commission 12
Lee Technologies Inc. 38
Liebert Corp. 40
Metrics Based Assessments LLC 40
Microsoft Corp. 6, 12, 18, 22, 23, 30, 40, 42
MIT 26
NetApp Inc. 30
NewBridge Bank 30
OhioHealth 30
Openet Telecom Inc. 22
Ouellette & Associates Consulting Inc. 45
Peak10 Inc. 18
People's United Bank 6
Rackspace Hosting 32, 34
Robert Half Technology 45
Rove Inc. 30
Santander Consumer USA Inc. 42
Silverback Migration Solutions Inc. 36
Skype Ltd. 26
Sun Microsystems Inc. 9, 18
Terremark Worldwide Inc. 42
Texas Tech University 38
The Bank of New York Mellon Corp. 6
The Hartford Financial Services Group Inc. 40
The Planet.com Internet Services Inc. 12
Trans-Union LLC 48
United Healthcare Services Inc. 6, 48
University of California, Irvine 6, 48
USA Inc. 42
Verari Systems Inc. 40
Verizon Wireless 12
Virgin America Inc. 32, 38, 40, 42
Virginia Credit Union 14
VMware Inc. 30
Yahoo Inc. 12

ADVERTISERS' INDEX

American Power Conversion 20-21
www.apc.com/promo
Best Practices in Infrastructure Management 43
BigFix 13
www.bigfix.com/beforeallhellbreaksloose
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www.usa.canon.com
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www.diskeeper.com/cwtrial
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FRANKLY SPEAKING

Frank Hayes

Theory and Reality

NINE BILLION DOLLARS. That's the theoretical cost of settling a privacy lawsuit against TransUnion, the Chicago-based credit reporting bureau. TransUnion won't actually spend $9 billion, of course; it will offer free credit monitoring (retail price: $59.75) to some 150 million Americans.

Meanwhile, back here in reality, 155 students have actually lost their very real tax refunds because of another data breach.

They're among 1,132 graduate students at the University of California, Irvine, who participated in a university health insurance program in 2006. That program was run by United Healthcare, which admits that some students' personal data "may have been accessed without authorization."

Whoever grabbed the information apparently used it to file phony tax returns. Result: When the students tried to file their legitimate returns, the IRS told them that returns had already been filed using their Social Security numbers.

No one is talking about specifics of the data breach at United Healthcare. The IRS won't talk about its investigation or how much the crooks got away with, though it probably comes to a few hundred thousand dollars at most. The university says it's arranging emergency loans for students who need their tax refunds to pay their bills, but it isn't divulging many details either.

That's OK. We already know enough to say this:

We've got to stop using Social Security numbers as a single-factor identifier. And allowing access to Social Security numbers on anything but a need-to-know basis. And storing unencrypted personal information.

That's no longer theory. It's just reality.

Look, we all love hearing impossibly big numbers like the ones in the TransUnion settlement. Billions of dollars? Hundreds of millions of people? Those stratospheric numbers don't seem real.

Our reality comes at a smaller scale, hundreds or thousands of data records at a time. Names. Addresses. Birth dates. Social Security numbers. Credit card numbers. Bank account information. We tell ourselves that it's safe — that our employees are trustworthy, our security is good enough, our piddling collection of data too small to worry about.

But that's exactly what's being stolen, as those 1,132 students have painfully learned.

And week by week, year by year, the number of data breaches grows — and thieves grow ever more efficient at converting stolen information into stolen money.

They're getting better at this. We're not.

Thieves are becoming ever more efficient at converting stolen info into stolen money. They're getting better at this. We're not.

We know what we need to do. We need to abandon the use of Social Security numbers for customer identification and authentication — this means you too, IRS.

We need to treat Social Security numbers and other personal information like the highly valuable, easily stolen commodities they are, and make them much harder to access in our systems.

And we need to encrypt, encrypt, encrypt.

None of this is rocket science for corporate IT shops. None of it will be cheap, either. At a time when business is down and belts are being tightened yet again, it'll be a hard sell to the CEO.

But it's time to budget money for it. Not money for theoretically perfect data security — but for a realistic response to a real threat.

Because there's nothing theoretical about this: If thieves can steal 1,132 students' information and convert it into $100,000, they can do it again and again — and they will.

And that $9 billion is getting closer to reality every day. ■

Frank Hayes *is Computerworld's senior news columnist. Contact him at frank_hayes@computerworld.com.*

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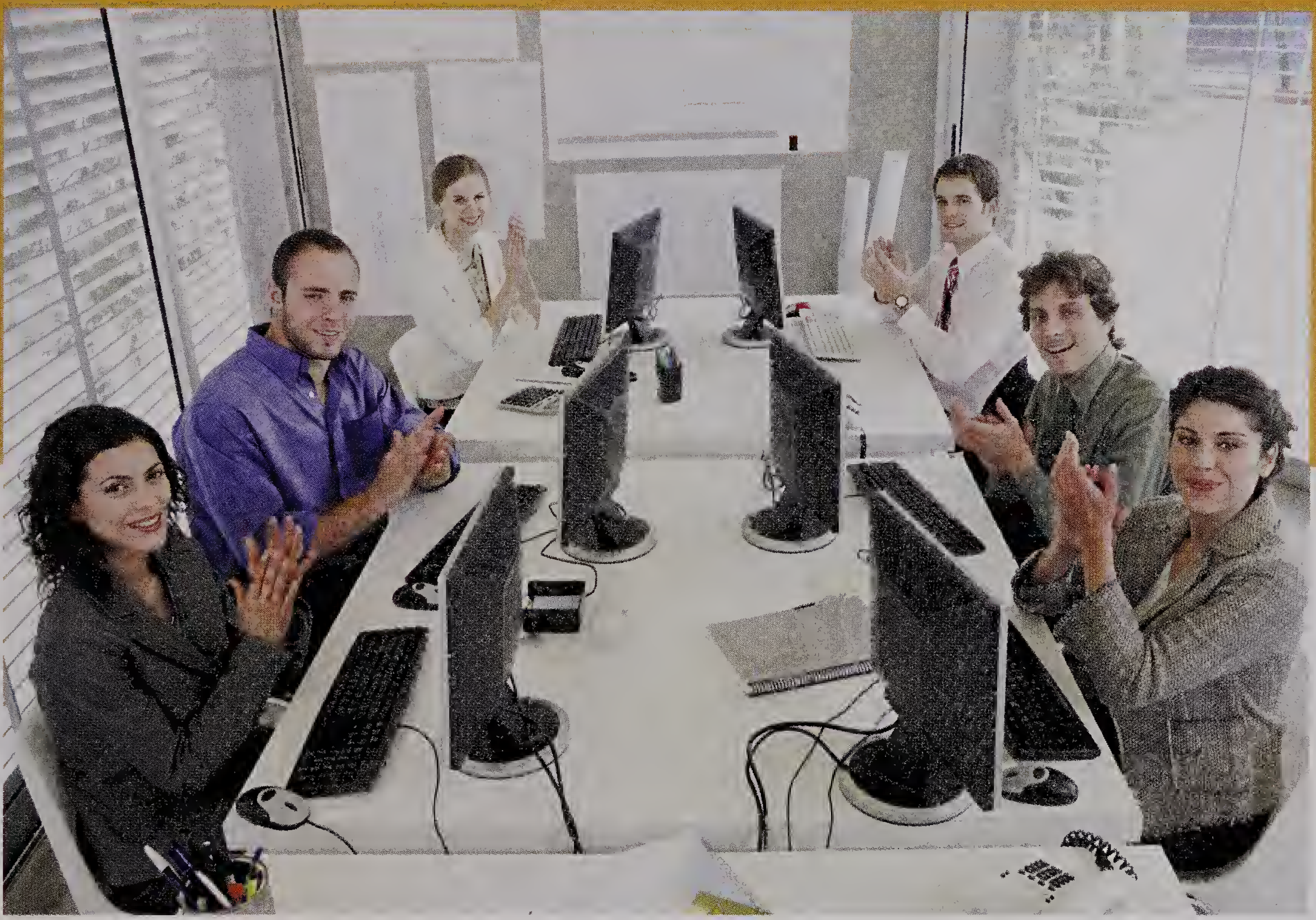

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